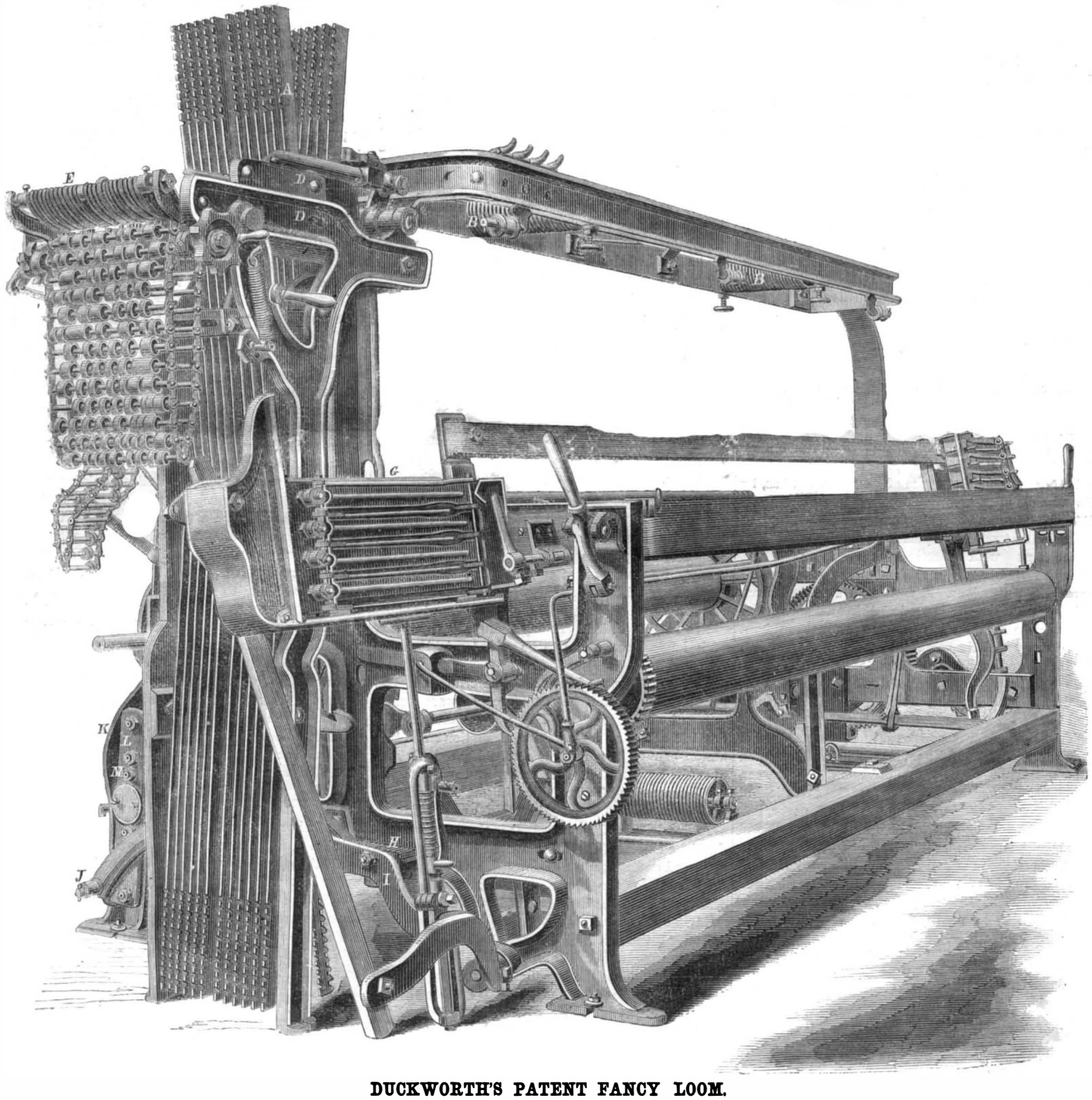
Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XV.—No. 12. [NEW SERIES.] NEW YORK, SEPTEMBER 15, 1866. $3 per Annum, [IN ADVANCE.]

Improved Fancy Loom.

The loom here illustrated is designed for weaving all kinds of figured fabrics, such as cassimeres, balmorals, shawls, woolen shirting, broadcloths, and all styles of fancy cotton and woolen goods.



DUCKWORTH'S PATENT FANCY LOOM.

The principal improvements on the loom are the harness motion and deep-box motion. The harness motion is shown at the left of the engraving; it will take in twenty-four harnesses. A is the side eddle lever, pivoted at the center and vibrating in both directions. It is connected to the eddle frames with round leather straps—not shown—passing around the pulleys, B B. The side eddle levers are provided with a series of notches for the purpose of obtaining more or less "shed" on the yarn. The motion is operated by a rock shaft having its bearings at C, and connected to knives sliding in parallel ways—not shown—at D D. One of these knives slides in one direction and the other in the opposite one. There is a set of hooked jacks connected to the side eddle levers, passing between the knives and resting on a set of levers, pivoted at E, and passing over the chain, F. If there are pulleys on the chain, F, they will raise one or more of the levers and elevate the hooked jacks to the upper knife, and as the knife moves it will carry the jack and vibrate the side eddle lever in the same direction. If there are no pulleys on the chain, F, the levers, E, will remain down, and the hooked jacks will rest on the lower knife; and, as the knife moves, will carry the hooked jack and vibrate the side eddle levers in an opposite direction. The chain, F, can extend to the floor without interfering or being supported.

This motion is built very strong and is designed for weaving heavy and light goods. It is secured by Letters Patent dated August 1, 1865.

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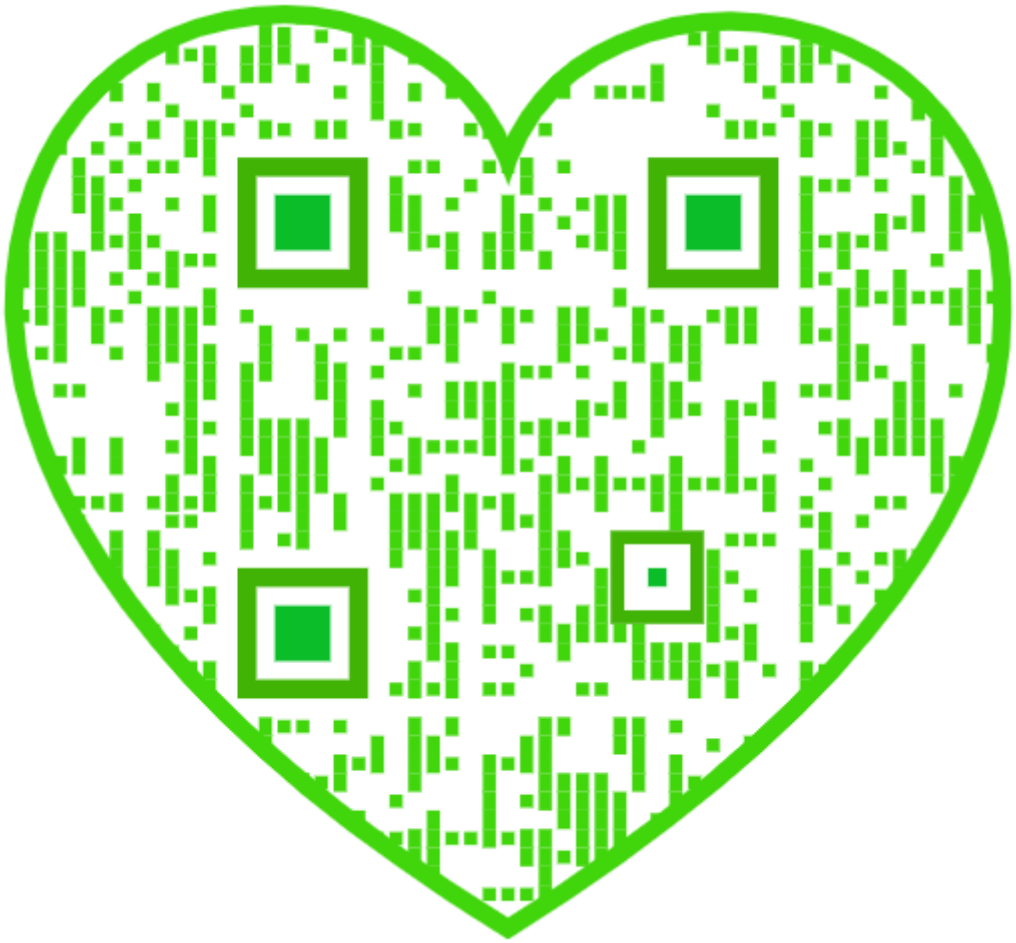

Next is the novel arrangement of the deep-box motion that is creating considerable interest among manufacturers. This motion commands any shuttle or color out of four, a point that has been long sought for, but has not heretofore been accomplished with success. The shuttle boxes, G, are operated by an inclined-plane-shaped cam, sliding at H, on which the shuttle-box lever, I, rests. The cam, H, is connected to a cross-arm, at J, which is vibrated by hooked arms, connected at K L M, which are attached at different distances from the center or pivot, and are operated by a vibrating lever—not shown—and governed by the pattern chain, N. If the bracket arm connected at K, be operated, it will move single boxes; but if the hooked arm, connected at L, be operated, it will skip from the first box to the third; and if the hooked arm, connected at M, be operated, it will skip from the first to the fourth box, or what is called fall deep or four boxes. The boxes are carried in the same way by similarly hooked arms attached at the lower end of the cross-arm. The shuttle boxes on the opposite end of the loom are operated by a shaft passing through the loom and connected to the cross-arm.

This motion is secured by Letters Patent, dated January 9, 1866. The rest of the movements of the loom are similar to those on an ordinary loom, but are of improved patterns. These looms are built for broad or narrow goods. For further information address Duckworth & Sons, Mount Carmel, Conn.

TWENTY-FIVE YEARS---A RETROSPECT.

In looking back through the dim vista of the past, and noting the world's advancement, we can detect no era so fruitful in results as that embraced within the period of the last twenty-five years. The great discoveries in science and the arts, the numerous useful inventions, the wonderful expansion of commerce, the finding of inexhaustible mines of precious metals, and the rapid growth in wealth and population, all tend to make the last quarter of a century unparalleled in the world's history. The whole civilized world has felt the impetus of growth and expansion, and we are happy to believe that our own favored land, untrammeled by the traditions and dead forms of the Old World, has not only distanced all other nations in the race of progress, but has, by its example of energy and enterprise, infused new life into effete and decaying nationalities.

Less than twenty-five years ago the first successful experiment with electro-telegraphy was made, though it had been the subject of investigation for some years previous. A wire was stretched from Washington to Baltimore in 1844, and soon after extended to New York, and very rapidly throughout the country and the world, till, at length, the earth is girdled, and time and space are literally annihilated. The author of this wonderful discovery still lives, in the enjoyment of a green old age, rich in honors and the substantial rewards of his genius.

Twenty-five years ago ocean steam navigation was a new thing, and its practicability had just been demonstrated. True, years before a little steamer, known as the *Savannah*, had crossed the Atlantic, but her daring feat had long been forgotten, never, perhaps, to be recalled, had not the Western World been waked up one morning by the astonishing news that the *Sirius*, a small English-built steamer, had arrived from London. The *Sirius* was soon followed by the *Great Western*—and thenceforth, ocean steam navigation became a fixed fact. Before, there had been no steamships, only steamboats—useful craft on lakes and rivers, and other inland waters—but the idea that steam could be made available for navigating the ocean had long been scouted in high places. Twenty-five years ago there were no steamships of war, but, ocean steam navigation having been demonstrated as practicable, the nations ceased to build sailing vessels for war purposes, and rapidly substituted steamers.

Twenty-five years ago most of the inventions of agricultural machinery, which now so lighten the labors of the farmer, while they increase his gains, were unknown. Who ever heard of the reaping machine till it made a sensation at the London Exposition in 1850? It must have had a brief existence before that, for it was sent, a perfected engine, from Chicago to London; but how few had ever heard of it; and now, who would think of working even a twenty-acre farm without its aid?

Twenty-five years ago there were railroads with locomotive engines, but they date only a few years anterior. The writer of this well remembers reading the account of Mr. Stephenson's first sucess in England, and he has not forgotten when the first short line was put in operation in this country. Twenty-five years ago railroad connection between the Hudson River and Lake Erie was scarcely completed, the Erie and the Hudson River lines were hardly thought of, and in the Great West, where the railroad may be said to have achieved its greatest triumphs, it had no existence at all. If the last twenty-five years did not witness the origin of the railroad, it has seen its wonderful expansion, until this country and Western Europe have been converted into gigantic gridirons by the crossing and interlacing of iron bands, and all other modes of land travel have become nearly obsolete, and a five-mile journey in an old-fashioned stage coach is more to be dreaded than a hundred miles in a rail car.

Twenty-five years ago California was unexplored and uninhabited, save by Indians and a few Mexican adventurers and outlaws, and its wealth of precious ores was a well-kept secret; and the other gold-producing States and Territories—Nevada, Colorado, Arizona, Montana, and Idaho—now so familiar to every ear, had no existence, save as they formed parts of the great unexplored Far West of the Rocky Mountain region.

Twenty-five years ago a hundred thousand dollars was regarded as a magnificent fortune, to which, though many aspired, few attained; and the number in the metropolis of the Western World whose estates reached this figure could be counted on one's fingers. There are more men in New York to-day whose annual incomes reach one hundred thousand dollars, than there were twenty five years ago of those whose entire possessions amounted to as much. Twenty-five years ago there were, possibly, half-a-dozen millionaires in the whole country. To-day they may be counted by hundreds.

Twenty-five years ago the population of the city of New York was little over three hundred thousand. To-day it is a round million, and the overflow into the adjacent country may be reckoned at half a million more.

Twenty-five years ago the population of the Empire State was less than two and a-half millions. To-day it cannot be much less than five millions.

Twenty-five years ago the population of the entire country was only seventeen millions. To-day it is nearly forty millions.

Twenty-five years ago there were twenty-eight States in the Union. To-day there are thirty-six, with half-a-dozen more to be added within a few years.

The world moves; but such wonderful strides as it has made within the last twenty-five years former generations never saw. Every department of life has felt and seen its accelerated motion; and it is almost enough to make one feel giddy to look back over the last quarter of a century and witness the rapid succession of discoveries in art and science, and the wonderful increase in wealth and population.

And what is the secret? It is the wonderfully-developed spirit of invention which has infused energy and enterprise into the world, and encouraged men to undertake the accomplishment of things which, without the inventor's aid, would have been wild and chimerical.

In 1840, the United States Patent Office issued lees than five hundred patents; in 1865 it issued six thousand. This is the key to the whole secret. Of the fifty thousand patents issued during the last twenty-five years in this country, some doubtless were worthless; others were of little account; while a very large number were of value beyond the power of man to compute. Their importance to commerce, to manufactures, to mining, and to agriculture, cannot be estimated. Who will undertake to compute the value of the sewing machine, to cite a single example; or how long would the gold fields of California have continued to give a profit to the miner, if the inventor had not come to his aid?

To the inventor and the mechanic, then, rather than to the statesman and the politician, is the world indebted for the wonderful growth of the last twenty-five years. They are the pioneers in the great army of progress, the *avant couriers* of every great social and moral revolution. ANTIQUARY.

Williams's Theory of the Diffusion of Steam.

[For the Scientific American.]

Charles Wye Williams, whose death was noticed recently, was for nearly forty years superintending agent of the Dublin and Liverpool Steam Packet Company. His practical experience in all the details incident to steam navigation, combined with a good share of scientific knowledge, render his opinions worthy of more than ordinary weight. The subjects to which his attention were more particularly directed, were the combustion of coal, heat, and steam.

Upon the former subject he published a work many years ago, which has become a text-book wherever it has been introduced. His views and opinions—the result of his own experience—received the sanction of such men as Dr. Ure, Prof. Brande, Robert Kane, and others of scarcely less note in the scientific world. A vast saving in fuel was the immediate result of adopting his system; and most of the patented devices of the present time, for mingling a suitable quantity of oxygen with the products of combustion, are but modifications of his discoveries and experiments. He was essentially a practical man, and where possible, he never failed of illustrating his ideas by diagrams and presenting them in visible form to the eye. At a much later day he published a work upon heat and steam, but his views upon these subjects, although the result of his own experience and observation, after a long and patient investigation, seem to have received but little attention, for the reason, probably, that they were opposed to the received opinions of the day. They, at least, brought him in collision with those whose previous writings had been considered as law upon the subject. The distinctive feature of the work is his doctrine of the diffusion of steam through the mass of the water. He contends that when a steam boiler is under pressure there is just as much steam contained in a cubic inch of the water space as there is in a cubic inch of the steam space. The water is. in fact, so far as the steam is concerned, empty space, or a vacuum into which the vapor enters. In this view he was supported by the previously-written opinion of Dr. Dalton, Sir John Herschel, and others, in their remarks on the diffusion of gases and vapors through liquids. He carried out to its legitimate result the now generally received "atomic theory," illustrating his position by diagrams of his experiments, and seeming, at least, to settle the point in his own favor.

In relation to the explosion of steam boilers, he repudiates the idea that heat can be "stored up" in the water, or that the water can flash into steam when relieved of pressure, according to Colborn and Clark, Dr. Alban, and many others. But he contends that the globules of steam in the water, being confined in a medium over eight hundred times as dense as the steam alone, fly into the steam space instantly when the pressure is removed, and there expand in volume in proportion to the density of the two mediums, or over eight hundred times. If the boiler was already strained to near its bursting point, a disastrous result might well be anticipated. If his theory of the diffusion of steam through the water is correct, we may pretty safely assume that his theory of steam boiler explosions will account for some, at least, of those disasters.

There are other phenomena in connection with this subject of heat and steam which can scarcely be accounted for upon any other hypothesis than that of Mr. Williams. For instance. Why will the temperature of water, in a steam boiler, when heated to say 300 deg., fall to 212 deg., or the boiling point, as soon as the pressure is removed, no matter how suddenly? Water, compared with vapor, is a solid body, and any other solid body, as metal, for instance, would retain its high temperature for a long time. But the mercury, though plunged to the center of the mass of water, will, just as soon as the pressure is removed, drop to the boiling point.

H. N. T.

GOLD quartz is profitably mined in Australia when it yields only two dollars per tun.

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Moire Antique.

This term is familiar to dealers in silks and those who wear them, but comparatively few know why it is applied to the class of goods bearing the name, or what is the process by which their peculiar character is given to them. As with most other articles in common use, the mass of persons are content to wear them without knowing any thing about how they are produced. The name is of French origin, as well as the goods, the word *moire* meaning simply watered, and is applied to the silks which have a wavy appearance imparted to them by being stamped when damp, and are consequently also called watered. The *antique* is added because of the resemblance which these goods bear to the heavy fabrics worn by our ancestrial grandams. Their peculiar appearance is owing to a slight inequality in the surface of the silk, and is produced either by an arrangement of the woof in the weaving, or by operating upon the surface after it is completed. A slight twisting of the threads composing the woof will give an undulating appearance to the silk by changing from place to place the angle of reflection of the light, but this effect is more commonly produced after the process of weaving has been completed. The discovery of this peculiar effect is said to have been accidental. A piece of silk rolled tight, when a little damp, was found to have this wavy appearance imparted to it, which suggested the idea of applying pressure, by which it is now effected. Machinery enables the manufacturer to give it any style of watering that he may choose. Two cylinders are prepared, one or both of which have slight prominences or depressions corresponding to the lines which he wishes the fabric to bear, and it is then passed between the cylinders under a heavy pressure, giving it a permanent stamp or figure. As the whole effect is produced by the reflection of the light, and as the unequal reflection depends upon the angle which different parts of the surface make with the rays, what is called the watered appearance is thus produced. The process is greatly facilitated by having the silk dampened before it receives the pressure, and still more by heating the cylinders, just as in the laundry the sprinkling of linen and the use of hot iron make the smoothing process more easy and the effect more complete and permanent. There is a great variety in the styles of watering. Some are simple and others more elaborate, the smaller patterns being more frequently known as watered and the larger more technically *moire antique*, but the process is the same, and the effect is owing to the same cause.

The preparation of this style of silks was formerly confined for the most part to France, where the art was kept secret for a long time, but it is now largely carried on in other countries, and to some extent in our own. It is a branch of the dyer's art to give to plain silks this watered appearance, and it is carried to such an extent that any style or pattern may be matched. Other fabrics beside silks are treated in the same way. What is known as moreen, a worsted material, has the same general appearance imparted to it by a similar process, but the effect is not as great, owing to the superior luster of silk, which gives it greater power of reflecting light, and thus makes the variety of the surface much greater. —*New York Journal of Commerce.*

The North Pole.

Two French gentlemen recently explored the island of Spitzbergen in a manner never before done. They have measured the mountains, mapped the whole coast, examined the vegetable products, the geological composition, etc., of the island. They have found that the long day extended over several months, during which the sun never sets, becoming intensely hot after a month or two by the unceasing heat from the sun. In this period vegetation springs up in great luxuriance and abundance. The North Pole is only a matter of 600 miles from the island, and it is thought by the two explorers, as by many others, that the pole itself, and the sea which is supposed to surround it, could be reached from Spitzbergen without many great difficulties being encountered. A singular fact noticed by the explorers, in connection with this island, is the enormous quantities of floating timber which literally cover the waters of the bays and creeks. A careful examination of the character, condition, and kind of these floating logs would, no doubt, lead to a conclusion as to whence and how they came, and probably suggest new theories for the solution of geographical problems connected with the arctic seas.

Improvements Going on South.

The South is going into manufacturing. All over the country new cotton mills are being built and put in operation. Georgia has heretofore nearly monopolized this branch of industry at the South; but now Mississippi and Alabama as well as the Carolinas are waking up to the advantage of the manufacture of cotton goods. At Camden, Alabama, a wealthy company have taken the initiatory steps to erect a large building, and fill it with the most approved machinery. At Carrollton, Mississippi, a factory is now in operation, which, in a short time, will employ one hundred and eighty spindles. In Marengo county, Alabama, they are making arrangements to manufacture on a large scale. At Cuba station, Sumter county, a factory is shortly to be in operation. These are a few of the indications that the South will soon become filled with factories. The results of the war in throwing capital into an entirely new channel, the facilities of easy intercommunication, abundance of material to be used in manufacturing, contiguity to the said material, equability of temperature, and a thousand other facts, point out this region as the future home of the factory.

Sawing Lumber.

We give the points of a long communication from Mr. J. W. Churchill, for the whole of which we have not room. He corrects some errors, in this communication, which appeared in No. 20 of Vol. XIV. viz: that for "contracts" it should read "counteracts the range of the saw," and for "running out at the log" it should be "running out of the log."

The instructions in that article comprehended the sawing of all sorts of lumber, hard and soft. Our correspondent insists that, notwithstanding the objections urged against his rules, they are correct and useful; that end play of the mandrel will make good work, and is preferable to changing the range of the saw many times a day. He has run a saw according to his rules many years, sawing millions of feet of lumber, and always did good work without changing the range of the saw, but allowing it to adjust itself to the different kinds of lumber. He thinks Emerson's rule of nine hundred feet per minute for the edge of a circular saw, is too slow, and that 16,000 feet of lumber sawed in an hour is a large amount, especially when applied to oak or maple. He objects to swedging alone, and prefers setting the teeth, as he has not swedged his saw for three years. He has sawed 2,200 feet of half-inch boards in one hour and eight minutes, and 18,000 feet in one day, always allowing end play.

The Change of Leaves.

The cause of the beautiful tint which our foliage assumes during the autumnal months, has long been a subject of investigation, and many are the hypotheses that have been put forth in explanation.

M. Fremy, who has devoted considerable attention to this subject, stated, as the result of a series of experiments, that he had succeeded in resolving the green coloring matter of the leaf (*chlorophyll*) into two components, one, a yellowish substance, he called *phylloxanthine*, the other a blue matter for which he proposed the name *phyllocyanine*. By considering the blue as more evanescent, the different shades of yellow leaves might be produced.

These views were very generally accepted till recently Fremy has again appeared, essentially retracting his original views. He now gives, as the result of subsequent experiments, the new supposition that *chlorophyll* is a simple green coloring matter very unfixed, being influenced by vegetation, thus passing through varied modifications.

M. Carey Lea, of Philadelphia, has lately advanced a theory in which he considers light as the primary cause, producing photographic changes of color.

During the healthy state of the leaf, vitality counteracts this influence, but as the fall approaches the frost begins its work; the petioles dry up, the leaf gradually loses its firm hold upon the branch, then the action of light, no longer held in check by the vital principle, predominates, the leaf falls away, but in fading acquires those brilliant hues that will soon variegate our forests.

MISCELLANEOUS SUMMARY.

It is stated that the salt mines of Nevada throw in the shade all others known in the United States. One bed is reported to cover 52,930 acres, yielding 2,000,000 bushels annually of salt, ninety-five per cent fine. No bottom to this salt bed has ever been discovered. As deep as any work has gone, the bed is solid rock salt, and from a depth of thirty-five feet the salt water comes so rapidly as to prevent work without efficient working arrangements. The salt water wells up to the surface and overflows the large floor from which the fine white salt is continually gathered. This floor, several acres in area, has been so well leveled that the water flows evenly over it, and this, by exposure to the atmosphere, is rapidly evaporated, leaving a stratum of fine salt. This yield and production go on continually, and the more rapidly it is removed the better the quality of this salt.

M. G. Planté has communicated to the Academy of Science at Paris, a description of his new apparatus for the production of ozone, by using electrodes of lead, in place of platinum, when ozone is sought by the electrolysis of water. He asserts that he can secure a much larger proportion than is obtained in the usual way.

Artificial Diamonds.—A correspondent of the *Mechanics' Magazine* details a process he has employed for crystallizing carbonic acid by means of a continuous electric current. At the end of three weeks he obtained a number of milky-white crystalline bodies, which, from their resisting not only the strongest acids, but also the oxygen flame, he more than intimates are artificial diamonds.

The Isthmus of Suez Canal appears decidedly destined to become a "great fact." Messrs. Bazin & Co., of Marseilles and Alexandria, advertise that as regular transit service by the canals of the Isthmus of Suez is about to be established, they will be shortly prepared to receive and forward goods.

Official information has been received from Madrid of the confirmation of the Royal Order, granting to Major General W. F. Smith, President of the International Ocean Telegraph Company, the right to establish lines of submarine telegraph between the United States and the West India Islands by way of Cuba.

The needle-gun has again been tried at Chalons, and found wanting. About one hundred and fifty of these weapons were put into the hands of the guards, and the commission has reported that these rifles are not suitable to French troops.

Arched floors of concrete, or beton, a mixture of broken stone, sand, and hydraulic cement, are being put down in Paris without any support of vaults, girders, or the like. The material is simply packed in or molded on timber centerings, which are withdrawn when the concrete has "set."

The largest masses of gold ever found were—first, that found at Ballarat, Australia, in 1859, which weighed 224 lbs.; second, that found in Calaveras county, Cal., in 1854, which weighed 195 lbs.

California is becoming a wool-manufacturing, as well as wool-growing country. A company for manufacturing woolen cloths has lately been incorporated at Marysville, and another at Stockton.

It is said that wood can be rendered uninflammable by coating it with a preparation composed of a solution of potash thickened with clay.

Good Steel Pens.—We are using some of Snow's round pointed pens, which give good satisfaction. There are twelve different grades, adapted to every variety of hand. We consider them a superior article, free from the annoyance of scratching, and next to the gold pen for ease of handling. They can be obtained of J. P. Snow, 47 Liberty street, New York City.

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HOW GRAIN IS STORED IN NEW YORK.

The influence exerted by the agricultural interest upon the prosperity of the United States can hardly be over-estimated. No other branch of industry has attained such gigantic proportions in so short a time, or wields at present such power for the welfare of the country.

The rise of the great cities of the West, the increased exports, with the corresponding influx of wealth, are each, to a great degree, due to the impulse of agriculture. Chicago, that marvel of progress, is, in itself, a power exerting more of authority on the world's destinies than many a German principality. The unparalleled growth of that city has been owing neither to her manufactures nor foreign commerce, but solely to agriculture and the commerce created by it. A comparison of her grain shipments during the past twenty-eight years, with the increase of wealth and population for the same period, furnishes substantial proof of the above assertion. From less than one hundred bushels in 1838, her exports now exceed fifty-one millions annually. In her position as the converging point through which pass the results of the industry of the entire West, she maintains her proud station, without a rival, as the largest primary grain depot of the world.

When we include the other great cities interested in the grain trade—Milwaukee, St. Louis, Cincinnati, Cleveland, Buffalo, and New York—we obtain a proper estimate of the vast importance of the agriculture of the United States, which not only supplies our own population, but furnishes, in addition, an almost inexhaustible granary for other nations.

The largest port of shipment, as also the largest receiving depot on the Eastern coast, is New York. Through this channel flows the great part of an immense supply on its way to market, either for home consumption or foreign exportation.

During the year ending September 1st, forty millions of bushels of grain were received in this city, of which sixteen millions were exported to England and the Continent. The storage and re-shipment of so large a quantity of grain has caused the erection of immense storehouses in New York and vicinity. We lately visited a model institution of this kind—the United States Elevator and Stores—situated at the foot of Degraw street, Brooklyn, and as the result of our inspection, present the following description:—

The elevator tower is upon the wharf fronting the East River, where there is a depth of water sufficient to float the largest vessels. Here are moored the barges freighted with grain as they arrive from the canals, and ships that are to receive the precious cargo and carry it all over the world. Into the holds of the barges is lowered an endless chain of buckets, properly mounted, technically called the "leg." Power and motion are then imparted by a steam engine, and the unloading proceeds. Raised in this manner from the vessel to a great hight, the grain is emptied into a receiver holding 1,800 bushels. From this receiver it falls upon the scales, where any quantity is easily and conveniently weighed. Raised still higher, having been screened and blown, it is easily reshipped if desired, being allowed to run down through tubes into the ships at the wharf.

When designed for storing, the grain is carried from the scales by the "screw conveyor," a distance of one hundred and seventy-five feet to the main building or storehouse.

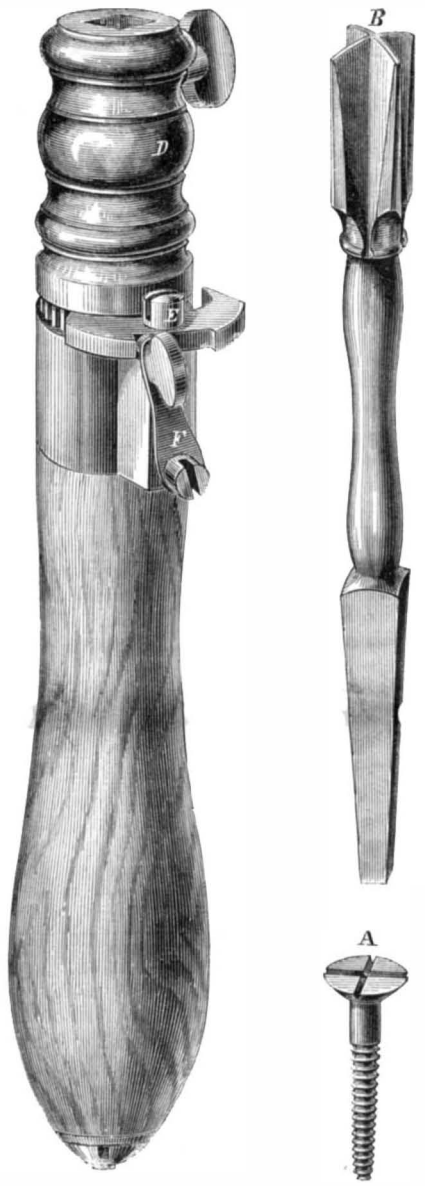
The storehouse is constructed on a new and ingenious plan, for which patents were secured to D. D. Badger, Esq., of this city, through the Scientific American Agency. Ninety-two cylindrical iron tanks, forty-two feet in length, each holding five thousand bushels, placed side by side, occupy the entire building. The intervening spaces between the cylinders, called "angles," have each a capacity for the storage of fourteen hundred bushels, giving a total accommodation for nearly half-a-million bushels. Over the center tank is placed a large receiver, connected to the main building by the "conveyor." From this general receiver, adjustable disbursing pipes are arranged so as to empty into any particular tank or angle, at the pleasure of the operator. By opening a valve in the bottom of each tank the grain may be discharged upon the first floor, and again elevated, if needed, for shipment.

The merits of this mode of storage over that commonly employed are apparent. The building is perfectly fire-proof, and the grain is stored in ninety-two immense iron safes. Economy of space, time, and expense, are other advantages. Under the common method, from eight to ten men are employed in unloading and trimming a cargo. This new plan requires but one man, and the work is performed in a more expeditious and satisfactory manner.

Our reporter is under great obligations to Mr. H. R. Westcott for attentions during our inspection of the establishment.

EVERSOL'S SCREW DRIVER.

The necessity of slipping the hand on the screw-driver, when driving home a screw, and the danger



of splitting the head of the screw when the friction is great, has led to the improvement illustrated in the engraving. If the blade of the common driver does not fit exactly the slot in the screw head, the bearing of the blade is on two opposite corners of the head, the weakest part of the screw, so that not unfrequently the beveled head flies off, breaking at the slot.

The object of this invention is to give a larger contact surface, and double the points of bearing between the driver and the screw; and at the same time to furnish a driver having but one motion. It will be easily understood by the engraving. A is a screw, with cross slots in the head, giving at least four points of frictional contact. B is the blade of the driver, quartered to fit the double slots. It is inserted and secured into the handle, C, as an ordinary bit into a brace. The socket, D, has a shank extending through and rotating in the handle. Connected with the socket, is a ratchet wheel, the teeth, like those of a common gear, which, with the socket and blade, is rotated by means of a pawl pivoted at E, to a knob, or lug, on the ferrule. This pawl turns the socket either to the right or left, as the spring, F, is moved to the one side or the other of the pivot, so that the motion of the hand in turning the handle one way or the other, operates to drive or remove the screw without removing the hand. A familiar illustration of the double pawl can be seen on almost any power planer in a machine shop.

Patented through the Scientific American Patent Agency, Aug. 14, 1866, by Cyrus Eversol, St. Louis, Mo., whom address for further information.

Steam as a Motor.

A correspondent, A. J. H., writes on the navigation of the air, insisting that all that is required to make it a permanent success is a proper motor, which will combine the necessary power with the requisite lightness, and says that steam is that motor. He claims to have made a rivetless boiler, which will bear a pressure of from 1,000 to 3,000 pounds per square inch.

By thus condensing an enormous power he believes aerostation is an accomplished fact, or, at least, is possible. We cannot agree with him that steam, however much super-heated, is adapted to the purpose. The weight of water, fuel, and machinery, to say nothing of the boiler, will be found to be too great, when compared with the mass to be moved in a fluid like air, to have much margin for available power. What is needed, not only for aerostation, but for other purposes, is an entirely new motor, which shall dispense with the weight of a boiler with its necessary appurtenances. The capacity of ships for freight is greatly reduced by the tunnage absorbed by the engines, boilers, and fuel. Machinery we must have to transmit the power from the generator to the element upon which, or through which, the ship moves. But the generator of the steam engine is cumbrous, heavy, and exacting in its demands. That a new motor will, in time, be contrived, without these drawbacks, we have no doubt; but until it is done we have but little faith in economic and successful navigation of the air.

A New Cement.

A late number of the London *Engineer* announces a new cement of great value, which is introduced under the euphonious title "The zopissa iron cement," which, it is claimed, is capable of joining any two solid substances, however dissimilar. Wood, brick, iron, stone, or glass, can be inseparably united with equal facility. A series of experiments witnessed by the *Engineer*, gave the following results:—

Plates of glass were firmly joined, edge to edge; ordinary bottles stuck upon the wall resisted all attempts at separation, till the stone yielded. Champagne bottles cemented bottom to bottom sustained a weight of two hundred and fifty pounds. Two bricks remained joined under a tension of three hundred and twenty-five pounds, till the brick itself fractured, but the cement remained firm. Brick work cemented with this has the solidity of a granite slab.

With paper treated with this preparation in solution, the inventor has made air and water-tight tubes, ammunition cases, coffins, and even constructed a house, one story and a-half in hight, perfectly wind and water-tight, which he now has on exhibition.

Of the constitution of this cement, or the expense of manufacturing it, the *Engineer* makes no intimations.

Imperishable Gut Cord and Belt.

The breaking of the cords of window weights is so frequent that it becomes a chronic annoyance. The manufacture of strong cord of gut has lately been commenced in Williamsburgh by Edward G. Vyse, 33 Grand st., which we can recommend to the attention of builders, house owners, and operators of machinery. The cord is made of gut or raw hide, and will last for sash weights a lifetime. For small round belts also its duration will be much greater than belts made of any other substance. The increased cost bears no sort of proportion to its increased durability.

GOLD has been found in Somers, Mass., specimens of the ore showing, by assaying, over ten ounces or $222,67 per tun.

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Correspondence

How to Put a Wood Saw in Good Order.

MESSRS. EDITORS:—I propose to give a few plain and simple directions how to file, and otherwise put in order, the common wood saw, so called, which is so generally used throughout the country for sawing up fire-wood by hand. I have filed wood saws for the community, here, for more than thirty years, and I have endeavored to profit by experience.

I will relate an incident that occurred a few years ago. A gentleman called on me one day, and, in conversation, stated that he had had considerable experience in filing all kinds of saws. I asked him how long it usually took him to file a wood saw; he answered, about half an hour. I told him that I could file one well in ten minutes. He seemed a little incredulous. I told him that I had just as soon file one as not, to prove my statement. I then took a wood saw of common hardness, which I had used for many years, but as the saw was not dull, I took a flat file and jointed down the points of the teeth until the saw was very dull indeed, I then directed the gentleman to take out his watch, which he did, and by it, in just four minutes, I had filed every tooth in the saw sharp and well. This was all the time consumed in filing the saw, but did not include the time of turning the saw over once in the clamp to file both sides.

I will describe the tools, etc., that I use for wood saws. First, a rest on which the saw is laid flat, and to which it is clamped. The rest is made from a piece of two-inch plank about thirty-two inches long, and six inches wide, and it is fastened down to the bench with one edge resting thereon, and the other edge raised, so that the surface of the rest will present an angle, with the bench, of about thirty deg. and slanting from the operator; the rest should be fixed directly opposite a window. Second, I use a six-inch three-corner file, with two handles, one of the handles is fixed upon the point of the file and it is only about two inches long and terminates in a sort of knob or ball at the end so as to be held conveniently with the thumb and two first fingers of the left hand. With two handles to the file, four times as much work can be done as there could be in using but one handle, and the work will be done far better. And, again, the file will do much more work before it is worn out, for it can be safely used the entire length of its cut.

To file the saw it must first be removed from the frame, and if the blank or uncut portions of the saw, at each end, project beyond the points of the teeth, then cut away this part as follows:—Lay the saw on an anvil or block of iron, and with a cold chisel make a cut on one side of the blank part of the saw, and as high up, and in line, with the roots of the teeth. Next, place the saw in the jaws of an iron vise just even with the cut, and with a hammer break off that part above the vise; it is all very easily done. Next examine the saw to see if there are any crooks in the plate, and if so, then place the saw flat on an anvil or other substitute, with the crook uppermost, and strike that part with the pane or corner of the face of the hammer, until the crook is removed. Next, the points of the teeth should be jointed off true and at perfect right angles with the sides of the plate; to do this a tool must be used which is made expressly for the purpose, consisting of a flat file, eight or ten inches long, which is fastened flat to the face of a piece of wood; and to this piece of wood are also fastened two other pieces of wood, each having a face at right angles with the face of the flat file. The depth of each face should be about one and a-half inches, and they should be so close together that the saw will only just pass between them while it is in the act of being jointed. After jointing the saw the teeth should next be set so as to be about twice as wide as the thickness of the saw plate at the back. The saw is now ready to be filed, and is next placed on the rest and clamped down to it with the teeth projecting a little above the upper edge of the rest.

Take the file by both handles and place it against the front side of the first tooth at the left end of the saw. See that the file is placed at the right angle both for the bevel and pitch of the teeth, and when this is right then keep the same position throughout the whole filing. Always file the front side of every alternate tooth first, then file the back side of the same teeth. Then turn over the saw and file the other side in the same way, always commencing at the left end of the saw and work toward the right. Care must be had not to file any tooth any more than just to bring it to a point. Next, if there should be a heavy feather edge left on the teeth, after filing, it should be scraped off with a sharp steel instrument. Next lay the saw flat on a bench and with a straight flat file, placed on the side of the teeth, pass it along over the sides of the teeth once very lightly, this will cause the saw to run smooth.

One word about saw frames. I advise all persons to choose a light saw frame, and, by all means, use a cord to strain it up with in preference to other devices.

JOHN S. DUTTON.

Jaffrey, N. H., Aug. 21, 1866.

Steam Fire Engines.

MESSRS. EDITORS:—In reply to the solicitation of C. H. H., I give you the performance of one of our steam fire engines, the *Citizens' Gift*. This is the oldest engine in use in our city, and has been in use thirteen years. Time of raising steam, 3 minutes and 40 seconds from the time the torch is applied until water is thrown from the nozzle; size of nozzle, 1½ inches; distance thrown, 310 feet, measuring from the end of the nozzle to the place where solid water fell; size of steam cylinder, 10 inches bore, 24 inches stroke; pumps, 6 inches bore, 24 inches stroke; double engine cranks at right angles; large air vessels, connected together; length of hose, 100 feet; steam, 100 pounds to the square inch; pressure on water cylinder, 240 pounds to the square inch; speed of engine, 110 revolutions; 220 strokes of pumps; grate surface, 16 feet; heating surface, 560 feet.

FINLEY LATTA.

Cincinnati, Aug. 27, 1866.

Must a Patent Dealer Take Out a License?

MESSRS. EDITORS:—Please inform me if a patentee, or his agents, canvassing for the sale of patent rights, requires a license.

B. M.

[A patentee does not require a license simply to transfer a patent. But, if he becomes a patent-right dealer, then he must have a license. So must his agents. The following is an extract from the existing law upon the subject of licenses:—

Patent-right dealers shall pay ten dollars. Every person whose business it is to sell, or offer for sale, patent rights, shall be regarded as a patent-right dealer.—EDS.

Gratifying Success.

MESSRS. MUNN & Co.—Allow me to inform you of my success in disposing of my patent on my bolt-cutting machine, which was patented through your Agency on the 5th of June last. I commenced operations about ten days ago, by selling one State, and to-day closed out the entire territory. I sold the thing myself, and all to parties in the city of Niles. I shall realize not far from $8,000 in the operation.

You will hear from me again, soon, as I am about making application for another patent.

D. D. ROBINSON.

Niles, Mich., Aug. 17th, 1866.

Welding Cast Iron and Steel.

MESSRS. EDITORS:—I notice in your column of "Notes and Queries," of the 11th, the query of J. G. B., in regard to welding cast iron and steel, as being practically unanswered. Supposing you desire to answer all such questions, for general as well as for individual information, I take the liberty of giving you the *modus operandi* of putting steel faces on cast iron anvils, or, rather, putting the anvils on the faces.

The plate of steel is highly polished and placed in the bottom of the mold, and dusted with fused borax. The hot cast iron is then poured into the mold, which is so "gated" as to cause it to pass over the plate and out at the other end, until the face is fused, when the escape is closed, and the mold filled.

It takes about three hundred pounds of melted metal to make a two hundred pound anvil.

W. H.

Atlanta, Ga., Aug. 22, 1866.

The Maynard Breech-loader vs. Muzzle-loaders.

MESSRS. EDITORS:—I witnessed, recently, a trial of breech and muzzle-loading rifles, which developed some interesting evidence. The distance shot was twenty rods (110 yards), the shooting was from a rest supporting both ends of the gun. Globe and peep sights were used on all the guns. A violent north-west wind was blowing directly across the line of fire. Forty strings, of ten shots each, were fired, and no one allowed to see his shots till his string was completed. The muzzle-loaders were none of them over 13 lbs. weight, made by first-class workmen, and provided with false muzzle and starters. The breech-loaders were all Maynard rifles, from 20 to 26 inches length of barrel, none of them weighing over 9 lbs.

No very nice work could be done while such a gale of wind was blowing. The match was won by a muzzle-loader, with a string of 11¼ inches from the center of the bull's eye to the center of each bullet hole. As this, however, is not a test of the comparative powers of the guns, and as these targets afforded a good opportunity of making such comparison, I selected the five best strings shot with muzzle-loaders, and an equal number of the best shot with Maynard rifles, and made very careful measurements of the circles of impact of the ten shots of each, without any regard to the distance from the bull's eye. The following table gives the results in inches, showing, first, the diameter of a circle passing through the centers of the two bullet holes furthest from each other in each string of ten shots; second, the vertical variation, or greatest vertical distance between any two shots; and, third, the horizontal variation or greatest horizontal distance between any two shots:—

Muzzle Loaders.			Maynard Rifles.		
Diam. of circle.	Vert. var.	Hor. var.	Diam. of circle.	Vert. var.	Hor. var.
3 3-16	2 1-16	2 2-16	2 5-16	1 12-16	2 3-16
3 5-16	3	3	2 12-16	2 8-16	2 9-16
3 13-16	1 11-16	3 8-16	3 4-16	2 7-16	2 8-16
3 15-16	2 7-16	3	3 8-16	3 4-16	2 2-16
4 10-16	2 14-16	4 10-16	4 3-16	2 14-16	3 9-16
18 14-16	12 14-16	16 4-16	16	12 13-16	12 15-16

In the aggregate of fifty shots it will be seen that the Maynard breech-loaders are ahead in the circle of shots $2\frac{1}{16}$ inches; in vertical variation, $\frac{1}{16}$th of an inch; and in horizontal variation, $3\frac{5}{16}$ inches.

I have no expectation that any evidence will affect the mind of the "Rocky Mountain Hunter," who replied to a previous communication of mine relating to breech-loaders, and based his denial of their superiority on the fact that he did'nt believe it; but as mere assertion is worth as much in one case as another, I will express my belief that breech-loaders are superior to muzzle-loaders for the very reason he assigns for the reverse, viz., because no patch is used on the ball.

H. W. S. C.

Danvers, Mass., Aug. 31, 1865.

A Signal Code.

MESSRS. EDITORS:—A correspondent wants a simple, universal signal code, easily understood and convenient for every body to use. Here it is. Simply learn the Morse telegraph alphabet and the thing is done. It has but two letters by which to spell every word in the language. With a red flag for a dot and a white flag for a dash, signals can be made and understood as easily as operators understand the dots and dashes sent over the wire. Perhaps this idea is original and patentable. If it is, it can be made available. Perhaps not otherwise, as people do not appreciate what they can have for nothing.

SOLON ROBINSON.

New York, Sep. 5, 1866.

An Inefficient Boiler.

MESSRS. EDITORS:—In reading in No. 9, current volume, of the SCIENTIFIC AMERICAN, I noticed an article headed "An Inefficient Boiler," and it strikes me that H. M. C. can readily obtain draught enough for his boiler as it is, by simply covering up a part of his grates. We have had a great deal of trouble with a boiler we are now using, through want of sufficient draught. After consulting most of our leading mechanics, it was thought that the square pipe leading from the flues to the smoke-stack was too small. This was changed to a round one twice the capacity of the flues, with the same result. Next, it was concluded the chimney should have twenty feet more, which was done, with like

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result. The exhaust was next introduced into the smoke-stack without benefit. In experimenting still further, we one day accidentally discovered the blaze of the fire in the front of the furnace striking down and seemingly coming up in the rear, whereupon we covered one-third of the grates (the rear) with a piece of sheet-iron, and since then have plenty of draught and are obliged to keep the furnace doors closed two-thirds of the time.

JNO. BABILLION.

Detroit, Mich.

The Explosion of Lamps.

MESSRS. EDITORS:—A correspondent of your paper inquires the cause of the explosion of his kerosene lamp. Kerosene lamps are always liable to explode when the tube that holds the wick is not put in right. In soldering it in, the workman usually leaves a small part open for the purpose of admitting air to fill the space in the lamp caused by the consumption of oil. This should never be done. But the tube should be soldered perfectly tight. The air will pass down by the side of the wick, to supply the space in the lamp from the diminution of the oil. Kerosene will explode as violently as alcohol, or spirits of turpentine, or burning fluid, only it requires a little more heat to do it, that is, to raise it into vapor preparatory to exploding. This I show by experiment in every course of lectures I deliver (I am a lecturer in chemistry) when I come to the topic of "burning-fluid and dangerous lamps." It is a great risk to use a lamp for any of the volatile burning-fluids, with an "air-hole," after the manner of the old sperm lamps. N. D.

Newark, N. J., August 23.

Softening Chilled Iron.

MESSRS. EDITORS:—Heat the iron red hot and expose it for a few minutes to the flame of brimstone. If the iron has a flat surface, the brimstone can be placed upon it, where it will burn itself out, leaving the iron as soft as ordinary cast-iron.

MACHINIST.

New Haven, Ct.

Cold Bleaching Process.

M. Tessié du Mothay and M. Rousseau describe very satisfactory trials which they have made of a cold bleaching process, by means of which all textile materials (whether silk, cotton, linen, flax, wool or any woolly fiber) can be bleached. The agent employed is permanganate of soda, slightly acid, prepared by a new and economical process. With this salt, the extraordinary properties of which have of late years been much studied, a bath is prepared, in which the materials to be bleached are dipped. They are stirred about with a glass rod from time to time, and after about ten minutes they are taken out of the bath, strongly colored of a violet-brown hue by an abundant deposit of oxide of manganese. They are then dipped as quickly as possible in a bath of water, acidulated with sulphurous acid, and again stirred and turned over with a glass rod, and after two or three minutes the materials or thread, originally of yellow or gray color, are already white. These operations are repeated twice more, and the result is a brilliant white, while the fibers are in no way injured. The materials operated upon were cotton fabrics, dirty as they came direct from the loom, as well as skeins of linen thread of a dark slate color, which, by existing processes, would have taken many days to bleach.—*Engineer.*

Fire in a Coal Mine.

For the last three months or so Mr. Blyth, mining engineer, has been employed, on behalf of Mr. Dixon, Govan Colliery, prosecuting a bore in search of ironstone on the estate of Sir William Stirling Maxwell, of Pollok. The exact position where the work is being carried on is in a field at an angle of the road leading to Pollokshaws, by Hagboose farmsteading and Haggs Castle, and about midway between these two places. For the last week it has been known to the workmen that gas or fire-damp had been escaping from the bore, and a few days ago they had to extinguish an inconsiderable jet of it which had been accidentally ignited. On Thursday morning a more serious occurrence of the same nature took place. One of the borers had sat down on a tool chest situated about 40 feet from the bore, and proceeded to light his pipe. No sooner was the match struck than he was enveloped in a sheet of flame, but he was only slightly burnt on the hands and face. The fire was conducted to the fountain-head at the bore, and there it was raging on Thursday night, and should no effectual means be found to put it out it is the opinion of skilled persons that it may burn on for a long period—months, perhaps years. When the fire broke out the workmen endeavored, with stout iron rods, which they used as rammers, to stop up the bore, but so strong was the rush of gas that three or four sturdy men were knocked aside. A cast iron boiler, weighing several hundred weight, was then thrown on the top of the flame, but it was instantly rent and tossed into the air. The boring apparatus, having taken fire, had to be torn down and the rods left in the bore, which is 2¼ inches, and has now attained a depth of 420 feet, and passed through the sandstone strata. There is every confidence that the rods will be recovered uninjured on the fire being got under, and it is only on the gas coming to the surface and into contact with the air that combustion begins. The roaring of the flames, which reach from 20 feet to 30 feet in hight, is very loud, and similar to that produced by the letting-off steam from a high pressure boiler. By a telegram from our Glasgow correspondent we learn that the fire died out yesterday, and that means have been taken to prevent the gas being again ignited. The boring operations will be suspended for a day or two.—*Scotsman.*

American Antiquities.

Between the Colorado river and California range of mountains is a vast desert, which, nevertheless, bears evidence of having once been thickly populated. Humboldt, during his researches on this continent, discovered abundant vestiges of a race more civilized and cultivated than any which occupied the country on its first discovery by Europeans. Recently a party of adventurers ascended the Colorado for a distance of about two hundred miles. They found the country on both banks destitute of vegetation, level, and monotonous. On one of the plains they discovered an object, which, after a tramp of five miles, they reached, and found a pyramid of stone laid in regular courses and rising over one hundred feet from the plain, the top presenting a surface of fifty feet square. Evidently a portion of the top had been dislodged, either by the hands of men or some convulsion of nature. The courses of stone were from eighteen inches to three feet in thickness, the outer courses cut at an angle corresponding to the inclination of the structure. The abrading action of the elements had so worn the joints that the ascent was a work of but little labor. By whom and when this pyramid was built will probably always remain a mystery.

War and a Nation's Debt.

War is the most costly enterprise nations can engage in, and war, in these days, is much more costly than formerly. Not to estimate the waste of property, the expense of material and means to wage war now, compared with that of former systems of warfare, is almost incredible. The cost of a single monitor, or ram, is more than that of the fleet engaged at Salamis. The cost of the equipment of one of our army corps in the late war would have sufficed to put on a war footing the army of Xerxes. When George the III. ascended the throne of England, in 1760, the national debt was one hundred and two millions. When he died in 1820, it was eight hundred and thirty-five millions of pounds. In sixty years it had increased seven hundred and thirty-three millions of pounds, or thirty-five hundred and thirty millions of dollars. Almost all this increase was legitimately a war debt. Every invention and discovery in art and science has tended, directly or indirectly, to make war more costly.

Telegraphic Blunders.

The alphabet employed in the telegraph service, has never been recommended on the score of accuracy or reliability. Many of the signs employed are so nearly alike, that absurd mistakes are of frequent occurrence. Mr. Cyrus W. Field, the great telegrapher, was himself lately made the victim of one of these blunders. The following telegram was received from him:—

ON BOARD STEAMER "GREAT EASTERN,"
Atlantic Ocean, Sept. 4, 1866.

To D. H. Craig, New York.

We have just received telegrams from London saying there is a serious outbreak in *Canada.* Please advise me accurately by cable, via Heart's Content and Valentia, in regard to the same.

CYRUS W. FIELD.

As no news of any Fenian invasion had been received in this city, the foregoing dispatch created no little astonishment until it was explained by another dispatch via London, dated Athens, Greece, stating that an insurrection had broken out in the "province of Candia."

NEW INVENTIONS.

ATTACHING SHOES TO HORSES' FEET.—THOMAS H. INCE, Westminster, London, England.—Patented May 29, 1866.—In this improved mode of attachment, the shoes are fastened to the hoof of the animal by screws, instead of nails, the holes in the shoe forming guides to direct the screws parallel to the walls of the hoof, the heads being countersunk in the fullering of the shoe. We understand that this invention has met great approval in England and Canada, under circumstances very trying to the security of the shoe, and as a matter of safety and symmetry, it is certainly better than risking the puncturing of the quick, and certainly defacing the surface of the hoof.

PIPE WRENCH.—WM. W. WILLS, Janesville, Wis.—Patented May 29, 1866.—This invention consists in pivoting the outer jaw of the wrench to a sleeve, which slides upon the bar, in such a manner that a firmer grip upon the pipe, or other article to be held, can be attained. The arrangement of Mr. Wills's wrench is such that it is easy in its operation, and very effective in its hold.

APPARATUS FOR PROPELLING STEAMSHIPS.—ARTHUR DOYLE, New York City.—This invention relates to an improved apparatus for propelling steamships, and consists in an arrangement of paddles or buckets which always maintain a vertical position in entering the water, moving through, and rising from it. The dip of the buckets is double or treble that of ordinary paddle-wheels, and may be of any desired depth, presenting in their passage through the water a great area of resisting surface.

FRUIT GATHERER.—WARREN H. STONE, Matherton, Mich.—Fruit growers have long desired some more effectual means for gathering their products, and inventors have not entirely disregarded their wants. Mr. Stone patented, on the 7th of August, a device which consists in combining a flexible apron with a frame so constructed that fruit may be gathered from the topmost part of trees, and conducted through the flexible tube, and lodged upon a canvas apron under the tree without bruising the fruit.

RAILROAD SWITCH.—CHARLES J. BAYER, Poughkeepsie, N. Y.—This railroad switch is in a measure self acting, or may be operated by the car wheelsso as to oe brought in proper position when the cars are moving in one direction, the switch requiring to be adjusted by hand when the cars are moving in the opposite direction. Its object is to prevent accidents by a careless management of the switch, by having the latter adjusted with certainty by the car wheels.

CIDER MILL.—HUGH SELLS, Vienna, C. W.—This invention relates to a cutting and crushing apparatus whereby the apples may be reduced in an expeditious and thorough manner; also to the construction of a receptacle to receive the crushed apples and in which receptacle the juice is expressed from the latter.

CULTIVATOR.—J. H. BARLEY, Longwood, Mo.—This cultivator belongs to that class which is provided with two laterally-moving plows, and it consists of such construction and arrangement of parts that the plows may be readily operated or moved laterally to conform to the sinuosities of the rows of plants, a strong and durable implement obtained and one which may be manufactured at a small expense.

GUARD ATTACHMENT FOR CULTIVATORS.—THOMAS B. MCCONAUGHEY, Newark, Del.—This invention consists in applying to a cultivator a guard so constructed and arranged as to prevent sods, clods of earth, etc., from being thrown upon the young plants, and obviate the necessity of a person following the cultivator, which is how necessary, in order to uncover the plants covered and crushed down by the ordinary cultivators in use.

PLOW.—GEORGE W. THOMPSON, Ripley, Ohio.—This invention consists in a novel construction o the mold boards and land side of hill-side plows, and in a novel manner of connecting the former to the latter, whereby the mold boards may be very readily turned and adjusted to either side of the beam, and a strong and durable plow, of the class specified, obtained.

FRUIT PICKER.—CYRUS M. LUNT AND WILBUR F. LUNT, Biddeford, Me.—This invention consists in the combination of a sliding rod having tines upon its end with an apron for conducting the fruit into the basket.

ILLUMINATED LETTERS, SIGNS, ETC.—JAMES HARRISON, New York City.—This invention has for its object to furnish improved illuminated letters, etc., by means of which the devices may be rendered clearly perceptible at a great distance when viewed at any angle. And it consists of the combination of glass cups with the letters or devices to be shown, and with the background of said letters or devices.

GRINDING MILL.—CORNELIUS BOLLINGER, Harrisburg, Pa. This invention has for its object the ventilating of the mill stones and it consists of a fan blower on the spindle which forces air up the spindles and distributes it between the stones through the hollow driver, and the air escapes up through the top of the case around the stones.

CORN PLANTER.—ALEXANDER LADD, St. Lawrence, N. Y.—This invention is designed more especially to be applied to hoe handles so as to be used in connection with a hoe to admit of the corn being dropped and covered at one operation.

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SPRING BED BOTTOM.—E. R. RISON, Kinmundy, Ill.—This invention furnishes an improved spring bed bottom, simple in construction, strong, and not liable to break or get out of order.

HORSE RAKE.—E. R. HALL, Ilion, N. Y.—This invention relates to that class of horse rakes in which wooden teeth are employed. It consists in a novel manner of hanging and arranging the rake so as to put it under the complete control of the driver, and render it capable of being raised and lowered, and turned in order to discharge its load with the greatest facility.

WHIFFLETREE.—GEO. WATT, Richmond, Va.—This improvement consists in making the double and single trees of rods so fashioned by the bending of one or more portions as to have an elasticity when power is applied to the ends and the middle loop held fast.

BURNING FLUID.—JOHN JANN, New Windsor, Md.—This invention consists of a composition of benzine 33 galons, sweet oil half a pint, and oil of vitriol 2 quarts.

DEVICE FOR LIFTING FLOUR AND OTHER BARRELS.—LUCIUS H. GOFF, St. Albans, Vt.—This invention relates to a novel and useful implement to be used for the lifting of flour and other barrels, whereby it can be accomplished with great convenience and in a most ready and comparatively easy manner.

CAR COUPLING.—GEORGE W. WILSON, Abingdon, Ill.—This is a simple, self-acting device for coupling railroad cars quickly and safely, consisting of an arrangment of cams and levers connected with the bumpers, which release themselves if a car is thrown off the track.

KINDLING MATERIAL.—C. A. ROSE, Columbus, Ga.—This invention consists in preparing a new kindling material by compressing into portable blocks the leaves of the southern pines, which are rich in resin and make a very inflammable and convenient kindling stuff, which can be afforded for less than wood, and opens up a new field of profitable industry hitherto neglected.

CULTIVATOR.—ADDISON F. STILWELL, Fayette, Iowa.—This invention consists in a novel manner of arranging the front plows of the devise, whereby the plows may be adjusted to perform different kinds of work as required.

CONSTRUCTION OF JOINTED MOLDS.—M. B. STAFFORD, New York City.—This is an improvement in jointed molds for brick, peat, soap and other machines for compressing and molding various substances. The object is to obtain a mold of the kind specified which will open freely and close tightly in such a manner as to leave no mark, impression or ridge in the article molded.

GATE.—B. S. HEALY, Cohocton, N. Y.—This invention is designed to furnish a simple, cheap, and convenient manner of hanging a gate.

SAFEGUARD FOR RAILROAD CROSSINGS.—ASA HILL, Providence, R. I.—This improvement in safeguards or barriers for railroad crossings, is to prevent accidents which frequently occur by imprudent attempts to cross the track in front of a passing train. It is simple in construction, capable of being put up at a very moderate expense, and operated or manipulated with the greatest facility.

CATAMENIAL SACK.—JOSEPH C. BENZINGER, Catonsville, Md.—The object of this invention is to produce a catamenial sack which will tend to maintain the person of the patient in a cleanly condition, and will prevent chafing.

WEEDING HOE.—W. J. WELLS, Sidney, Ohio.—This invention consists in a novel construction of a weeding hoe, whereby many important advantages are obtained.

CORN PLANTER.—BARNABUS CLARK, Mackinaw, Ill.—This machine is for planting corn in hills or check rows without any previous furrowing of the ground. Its object is to obtain a simple device for the purpose, and one whose parts will be under the complete control of the driver or operator, and be capable of being rendered operative and inoperative, when desired, with the greatest facility.

ROCK-DRILLING MACHINE.—GEORGE F. UNDERHILL, Brooklyn, N. Y.—This invention consists principally in a novel arrangement of parts for operating the drill of the machine.

HOLDING DRIVING REINS.—MILTON WHIPPLE, Medina, N. Y.—This invention consists in a device composed of a vibrating spring attached to a bed plate, between which spring and plate the reins may be readily inserted, and thereby held and prevented from getting under the horse's feet or otherwise entangled while the driver temporarily leaves the carriage.

MACHINE FOR BORING AND TENONING.—JAMES LEFEBER, Cambridge City, Iowa.—This invention consists in a combined boring and tenoning machine, adapted especially for the manufacture of wheels of carriages and other vehicles. It is also calculated for finishing or completing the wheel thereon, so that it need not be removed until it is finished. The fellies can be doweled thereon by placing a doweling table on the machine.

CLOTHES DRIER.—J. C. CONNOR, Dover, N. H.—This clothes drier is light, simple in construction, cheap, and occupies little space either when folded or when open; and which at the same time is strong, affords a large amount of drying surface, and allows a free circulation of air among the suspended clothes.

ATTACHING KNIVES TO THEIR HANDLES.—WILLIAM CLAYTON, Bristol, Conn.—This invention consists in passing the tang of the blade through the handle of the knife and securing it at the rear end of the handle by a nut, which screws on a screw thread cut on the end of the said tang, by which means the knife is made strong and firm; and it possesses the quality of being fastened without the use of cement or rivets, and produces a neat and comely-appearing article of cutlery.

EARTH SCRAPER.—NELSON PECK, Jay, N. Y.—This is an improved scraper for moving earth from one place to another in making and repairing roads, and for other purposes.

FENCE.—GEORGE S. CARLISLE, Columbus City, Iowa.—This invention consists in attaching braces to each other and to the ends of the adjacent panels of fence, for the purpose of firmly sustaining the fence, and at the same time enabling said fence to be readily removed and again set up in any desired situation.

SAFETY WHIFFLETREE.—W. A. HARBALL, Washington, Ind.—This invention has for its object to furnish an improved whiffletree, by means of which the horse may be released from the carriage whenever he becomes so unmanageable as to render it advisable.

MACHINE FOR BORING WELLS, ETC.—COLIN MATHER, Manchester, Eng.—This invention relates to a machine for boring wells or other holes in the ground, in which a flat drill rope or band is used, in contradistinction to the ordinary round rope and metal rods, the drill being arranged in such a manner that it makes a part of a revolution after each blow. The drill rope extends over a pulley which is secured to the top end of a piston rod, to which a rising and falling motion is imparted by the action of steam on a piston fitted into a suitable cylinder.

DRILL FOR BORING WELLS, ETC.—COLIN MATHER, Manchester, Eng.—This is a drill the cutting part of which is composed of a series of flaring cutters or chisels, secured in a suitable head in such a manner that a hole of considerable diameter can be bored, and that the cutter can be readily kept in order, each of the chisels being made so that it can be removed independent of the others, and sharpened or replaced by a new one at short notice, and with little loss of time or expense.

PORTABLE RAILROAD.—JOHN W. PETELER, Sheppach, Bavaria.—The object of this invention is a portable railroad, which can be readily transported from one place to another, and easily put down or taken up, and which can be used with great advantage for passing over marsh land, for building roads, or for engineering or building operations in general.

LOOM.—ISAAC N. HODSON, Mount Pleasant, Iowa.—This invention consists in the arrangement of a grooved roller, to which an oscillating motion is imparted by the action of a suitable toe or tappet attached to the lay or batten, and which are provided with double, triple or multifarious cranks intended to impart the required rising and falling motion to the heddle frames, in such a manner that two or more heddle frames can be operated by the motion of the batten, and the construction of the loom is materially simplified.

CHURN.—JACOB H. MENDENHALL, Cerro Gordo, Ind.—This invention has for its object to furnish an improved churn, easily and conveniently operated, and which will do its work quickly and thoroughly.

WAGON OR CARRIAGE GEARING.—J. R. MCALISTER, Richville, N. Y.—In this invention the reach-pole is dispensed with, and the wagon body is connected with the front and rear axletrees by means of four or more trace rods, in a novel and peculiar manner, whereby strength, durability, lightness, and cheapness are secured, and the pitching, either backward or forward, of the wagon-body is entirely prevented.

TELEGRAPH INSTRUMENT.—ALONZO CHASE, Syracuse, N. Y.—The object of this invention is to enable persons who are not skilled in or acquainted with the system of telegraphing to signal any message over the wires of a line of telegraph.

BAG HOLDER.—GILBERT E. CORBIN, St. John's, Mich.—The object of this invention is to produce a bag holder that will be susceptible of adjustment to any of the varying sizes of the bags.

ORGAN REED.—A. M. BRUSH, Clayton, N. Y.—This invention consists in the use of silver in the manufacture of organ and other similar reeds, whether alone, or mixed, or alloyed with other metals.

COMBINED TOILET STAND AND MIRROR.—W. H. HUGHES and H. L. LENT, Peekskill, N. Y.—This invention consists in combining with a toilet stand a mirror, in such a manner that its height from the top of the stand can be adjusted to suit the wishes of the person who is using it, and according as may be deemed necessary.

DIES FOR HEADING BOLTS.—JOHN W. SIBBET, Cincinnati, Ohio.—The object of this invention is to furnish dies for heading bolts of any size or length, having heads of any desired shape, and square or round necks; and it consists of improved dies formed in parts, and in the combination with the said dies of headers for forming the heads.

CLOTHES-WASHING MACHINE.—M. J. LOWRENTZ, Leavenworth, Kansas.—This invention is for washing clothes, and consists in a novel construction and arrangement of parts, whereby clothes may be thoroughly cleaned without injury and with but a moderate expenditure of power.

SCHOOL DESK AND SEAT.—GEORGE MUNGER, New York City.—This invention relates to a school desk and seat, which is constructed of a number of pieces joined together by dovetails or flat tongues and grooves, so that the desk or settee can be readily taken apart and packed in a comparatively small compass, and when it is to be used it can be put up by any person of ordinary mechanical skill without much loss of time.

HYDROCARBON VAPOR MACHINE.—JAMES F. SPENCE, Williamsburgh, N. Y.—This invention relates to a hydrocarbon vapor apparatus, in which two air wheels are used, working in one and the same case, and operating in combination with said case in such a manner that a steady light is produced without the aid of a gas receiver. The supply oil vessel is provided with a jacket to receive steam or hot air, in such a manner that the oil is heated before it is admitted to the machine, and the formation of the illuminating mixture is considerably facilitated. The hot air is generated in a chamber attached to the machine, and heated by a burner supplied with gas from the machine. The quantity of oil contained in the machine is regulated automatically by a float, carrying a stop valve, which closes the mouth of the feed-pipes as soon as the liquid in the machine has reached the desired hight.

SAND PUMP.—COLIN MATHER, Manchester, England.—This sand or shell pump is provided with a cylindrical barrel similar to that of an ordinary pump, and provided at its lower end with a valve or clack opening upward, somewhat similar to that in ordinary pumps, but instead of being fastened to the cylinder, its seating is in an annular frame, which is drawn up against the end of the cylinder by a rod passing up to a wrought iron guide or bridge at the top, where it is finally secured by a cotter or key.

HOOP-SHAVING MACHINE.—J. G. MORGAN, Colton, N. Y.—This invention has for its object to furnish an improved machine, by means of which hoops may be shaved conveniently, quickly, and accurately.

ELECTRIC BATON.—R. G. PIKE, New York City.—This invention relates to a contrivance for lighting gas by electricity, which may be considered in two parts, viz: the electric baton and the deflector, the former being the generator of the electric spark, and the latter the means to bring said spark properly in contact with the gas.

APPARATUS FOR RECEIVING, DISCHARGING, AND TRANSFERRING FREIGHT, ETC.—NEWTON A. PATTERSON, Kingston, Tenn.—The object of this invention is to furnish an improved apparatus for receiving and discharging freight from railroad cars and vessels, and for transferring it from one place to another, whether it be about the depot, about the wharf, or in any other place.

BED CHAIR.—E. HAMBUJER, Detroit, Mich.—This invention consists of an improved bed chair formed by combining the back seat, cushion, and legs with each other and with the frame of the chair, in such a way as to furnish an easy chair, which may be readily converted into a comfortable bed.

NECK TIE.—JAMES K. P. PINE, Troy, N. Y.—This invention relates to a substitute for the ordinary neck ties, and consists in making them of paper, card-board, or other similar materials and ornamenting them with any suitable design, in imitation of the ordinary neck ties, etc.

FENCE.—CHARLES LEE, Winchester, Ohio.—This invention has for its object to furnish an improved fence, light, strong, and durable, and which may be easily and quickly put up and taken down, and consists principally in the cast-iron flanged loops in combination with the posts and boards of the fence.

Notes and Queries

Watchmaker, of Mass.—The superior finish of the steel work in English watches is simply the result of patient labor. Oil stone dust, crocus, rouge, Vienna lime, etc., are the materials used, applied by means of block tin, glass plate, or boxwood. They finish by hand and we by machinery.

L. G., of Pa.—Lathes built by the best makers always have a belt guard at the rear of the small pulley of the cone. If your counter-shaft is in line with your head arbor, and you use both hands in shifting the belt, there is no necessity of tearing the belt in the gear. The destruction of belts you speak of is simply the result of culpable carelessness. We have used lathes for many years without injury to the belts.

E. H. S., of Ohio.—Galvanizing, probably to suit your purpose, can be effected by cleaning the iron with acid, sulphuric or hydrochloric, and water, and plunging it in a bath of melted zinc. The deposition of the zinc by means of the galvanic battery is more effectual, but more costly and troublesome.

J. D. S., of——.—Gun barrels are blued by heating in a charcoal fire. Packing them in boxes with sand before going into the fire insures a more even color.

A. M. S., of N. Y.—We know of no way to blue iron or steel without heating except by a lacquer.

L. M., of Mass.—Nine-ninths is a unit and not a fraction. Written 9-9 it may be technically considered fractional, but is so only in form. One hundred is no more a fraction when expressed thus: 99 9-9 than when expressed as 100.

J. H. F., of N. Y.—There is no particular reason except that of convenience in placing a beam engine of a steamboat fore or aft the shaft. It will work equally well in either position.

Mechanic, of Ohio.—Send to Henry Carey Baird, 406 Walnut street, Philadelphia, and he will furnish you what you need for the study of draughting.

H. C., of Mass.—There are conflicting statements as to the shortest trips to Europe by steamers and sailing vessels. We cannot afford the time to study and decide the question you ask.

E. H. L., of Mo.—Bleaching powder is not manufactured in the United States, and the manufacture is profitable only where extensive alkali works are in operation. The oxide of manganese is not mined in this country. One of the most valuable mines of chrome iron in the world is found in the State of Maryland.

W. A. K., of Ohio.—An alloy of zinc and iron can be made by any one of the methods used for making brass, substituting the iron for the copper. But as the melting point of the iron is higher than that of the copper, the difficulties will be greater. We are not aware that such an alloy is used in any of the arts.

D. P., of Ohio.—Silicate of soda has the same properties as silicate of potash, and a solution of it is an article of commerce under the name of liquid quartz. You can buy a small quantity cheaper than you can make it.

N. D., of N. J.—The highest authorities in chemistry have adopted the changes in the nomenclature, and use such expressions as sulphate of sodium, carbonate of calcium, etc. The school books are not the best sources for the latest progress of science.

SPECIAL NOTICES.

John R. Moffit, of Chelsea, Mass., formerly of Piqua, Ohio, having petitioned for the extension of a patent granted to him on the 30th day of November, 1852, for an improvement in grain separators, and reissued on the 17th day of May, 1859, in three divisions—A B and C, numbered respectively 715, 716, and 717—this petition being for the extension of the reissue, B, numbered 716, it is ordered that the said petition be heard on Monday, the 12th day of November next.

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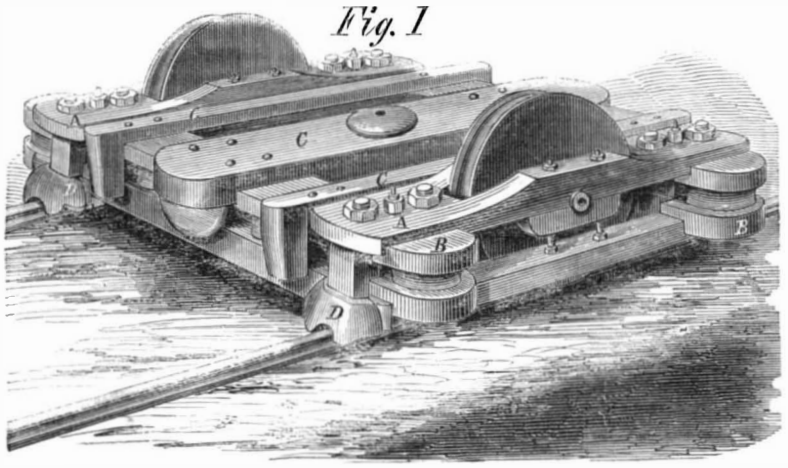
Improved Suspension Car Truck.

Cases have been known where a train of cars has been lifted bodily from the track by a tornado, and accidents have occurred which were attributed to the top-heaviness of cars, owing to their elevation from the track and the narrowness of their bases in the spread of the wheels. This improved truck is intended to bring the weight of the car nearer the track than is possible in the ordinary truck, to facilitate the ingress and egress of passengers, the loading and unloading of freight, to admit of the use of wheels larger than those commonly employed, and to allow independent action of the wheels on either side of the car.

Fig. 1 is a perspective view of a single truck. It will be seen that the body of the truck is suspended beneath the center of the axle, thus bringing the car bottom so much nearer the rails. The wheels run in brackets, A, which are connected by double cross-ties, B. Between the upper and lower portions of the cross-ties, springs of rubber, or other suitable material, are interposed, and the whole frame is braced and made solid by longitudinal ties, C. The rubbers, D, are intended to run near the rail for the purpose of clearing obstructions from the track, and securing the cars on the track if by any means the wheels should be lifted from their places. To further secure this object, the wheels can be made with a light outer lip, as shown in the engraving. This is practicable in this truck, as the wheels move independently of one another on short axes.

Fig. 1



STRAIT'S SUSPENSION CAR TRUCK.

With these trucks the cars can fall but a short distance in case of collision, or running off the track. Larger car wheels may be used with greater speed and safety than with the ordinary truck, as the weight is suspended so near the rails. The truck may be attached to the car in the usual way or so that the wheels may work in wheel houses inside the car or in recesses outside, so that the car may be made wider, or consist of two stories. It is claimed that the wheels, being on independent axles, are subjected to much less wear and tear in rounding curves than where both of a pair of wheels are secured to the same axle. Patented May 22, 1866, by H. Strait, 66 East Pearl street, Cincinnati, Ohio, whom address for further information.

Fig. 2

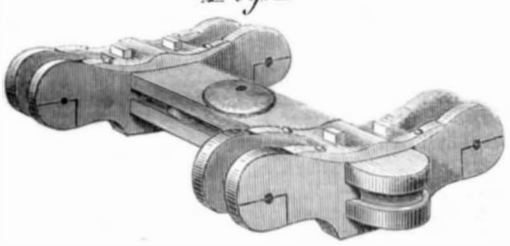


Fig. 3

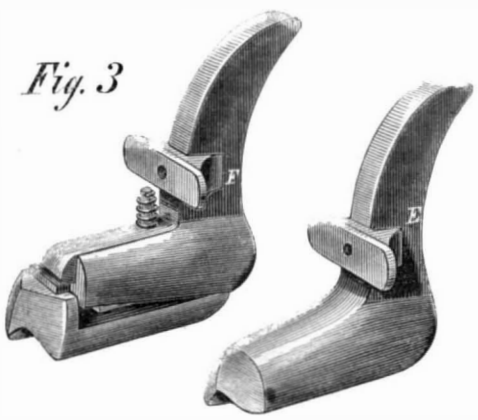


Fig. 2 shows a double truck intended for four wheels. Its plan of construction will be readily understood by the engraving without reference to its parts. Fig. 3 represents rubbers or guides to be attached to the double truck, projecting in front and in rear of the wheels. E is a fixed rubber at the rear of the wheel, and F an adjustable rubber, which can be raised or lowered at will by means of a bolt and spring.

KEENER'S PATENT HAT RACK.

Gentlemen are often much provoked by having their fine and costly silk and fur hats tumbled about the floor on account of the difficulty of balancing and supporting the entire length of crown upon the short hook or pin of ordinary hat racks. This occurs at parties or other gatherings, where many hats are

crowded together, or in hotels, private houses, offices, and elsewhere, and, as a result of such rough usage, many a valuable hat does not live out half its days.

The annexed engraving shows Keener's patent elliptic hat rack, which is designed to obviate this difficulty. In the place of the old form of hat hook, he supplies an elliptic ring or loop of metal or other material; this is suspended from an eye or hook. In using it, the ring is lifted to a horizontal position with one hand by means of a slight finger piece at its lower end, while the crown of the hat is inserted in the ring from below. The ring is then dropped to its pendent position, holding the rim of the hat against the wall or rack frame, as shown in the engraving.

Thus secured, it is impossible for the hat to fall of itself; it matters not how high the crown may be, it is safe. This form of rack may also be used for ladies' or misses' hats and bonnets, boys' caps, etc. If it is desirable to use it in connection with the old hooks for coats, the rings may be so placed as to bring the hooks in their center; by this means the coat may be hung under the hat. This patent was obtained through the Scientific American Patent Agency. As the patentee is not prepared to manufacture these racks, he will sell the rights. [See advertisement in another column.]

HARLOW'S ASH SIFTER.

The old-fashioned wood fire, although having its inconveniences, is free from the plague of ash sifting and its attendant annoyances of dirt and labor. We have yet to see the person fond of poking the fire, who is equally enamored of sifting coal ashes. Economy, however, demands that ashes should be sifted, and he who can provide the means of doing the work effectively, divorced from its annoyances, is entitled to the thanks of the housewife. This is the intention of the improvement herewith illustrated.

It is a box containing a cylinder, A, of wire gauze which is rotated by a crank. The cover has a small trap, B, which is opened to admit the introduction of the mixed coal and ashes, the cylinder being held by the pawl, C, so that the opening, D, is retained opposite the trap. A partition, extends across the drum from the center to the periphery, and a door, E, pivoted on the central shaft closes the aperture. This door is secured by a button, seen at F, held by a spring. The lug, G, fastened to the inside of the case, turns this button and opens the door, E, at each revolution, and it is closed again by its own weight after passing the center. This arrangement tends to throw the ashes from side to side until they are thoroughly sifted, while the position of the door, when open, prevents the escape of either ashes or coal from the cylinder. When properly sifted the

pawl, C, is lifted, the cylinder turned to the left, and the coal is dumped through the shute, H, into a hod. The contrivance is easily secured to the top of a barrel which receives the ashes and prevents them from escaping.

Patented through the Scientific American Patent Agency, April 24, 1866, by P. Harlow, Kingston, Ulster Co., N. Y., whom address for additional information.

REMARKABLE PASSAGE.—The English papers notice the fact that during the run from New York to Brest, the *Pereire* exceeded the *Ville de Paris's* run, the voyage being of extraordinary quickness, the distance from New York to Brest, which is 26 miles further from New York than Liverpool, and 225 miles further than Queenstown, being accomplished in eight days and 22 hours, giving an average speed of 14 knots an hour—a rate of steaming without parallel.

PAPER, as well as cotton fabrics, can be rendered partially fire-proof by immersion in a solution of alum.

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THE

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

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VOL. XV., No. 12, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, SEPT. 15, 1866.

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THE RECOVERY OF THE CABLE OF 1865---DEEP-WATER FISHING.

One of Joe Miller's Irishmen carelessly let the teapot go overboard. His wit, it is said, saved him from the punishment which he otherwise would have deserved. After the captain had admitted that if he knew where a thing was it could not be considered to be lost, Pat was emboldened to assure the captain that his "taypot was at the bottom of the say." But the wit of this is greatly tarnished by a recent exploit at sea. We shall now need some new theory, and a better proverb than "a needle in a haystack" to convey a notion of what we consider impossible.

The exploit to which we refer is the recovery of the Atlantic cable which was lost at sea August 2, 1865. At the time of the parting of the cable, twelve hundred and thirteen miles had been paid out, and the many attempts then made to fish up the end and make a splice were fruitless. The new fishing expedition sailed with the *Great Eastern* on August 9th; on the 12th all was ready and the dragging the bottom of the ocean with grappling tools commenced; on the 17th the cable was brought to the surface and was greeted with cheers, but the rejoicing was only for a moment—the cable quietly slipped from its fastenings and sank again to the bottom of the sea. Three times was this success, ending in failure, repeated. But on the 26th, the cable appeared for the fifth time, and a permanent union was made with the coil on board the *Great Eastern*. An examination showed it had not been injured and was in perfect working order. It carried the good news to Valentia, which, in a few minutes, was returned to America. Since its recovery the cable has been in constant use. Cyrus W. Field, who was one of those with the expedition, asked the news from home by way of Ireland!

This, to our mind, is one of the most admirable engineering feats of the day. To think of finding the exact spot on the pathless ocean, and then from the bottom, two miles down, picking up a slender wire! It is only the science of the nineteenth century that could accomplish such an undertaking.

THE process of grinding the speculum used with the Rosse telescope occupied six weeks. A small steam engine furnished the motive power for the operation.

FUMIGATING.

The ancient Greeks, children as they were in science, and especially in chemical science, had, nevertheless, discovered that certain substances have the power to promote putrefaction; and this property they expressed by the word *septikos* from their verb *sepo*, to putrefy. Hence the word antiseptic to express the property of preventing putrefaction.

Since it has been ascertained that yeast and other substances which promote fermentation are growing plants, which are propagated by means of minute seeds or germs, it has been supposed that some, at least, of the antiseptics operate by killing these germs. Of all known substances the two which are most efficient in the destruction of septic germs are carbolic acid and sulphurous acid. Carbolic acid has been recently described in these columns; it is one of the many useful and wonderful substances that are produced when bituminous coal is subjected to destructive distillation. Sulphurous acid is the substance usually employed in fumigation, especially when fumigation is resorted to as a means of preventing the spread of cholera.

The advantage of sulphurous acid for fumigating is, that at ordinary temperatures it exists in a state of gas; consequently it diffuses itself throughout a house or apartment, and enters every crevice in the walls and ceilings, as well as every crack in the floors. Nothing could be more searching, thorough, and efficient in its operation. It destroys not only all septic germs, but also all kinds of animal life. When a house is filled with it, every rat, mouse, cockroach, and bedbug must flee from the premises or be instantly destroyed.

Sulphurous acid is composed of sulphur and oxygen, in the proportion of one atom of sulphur to two of oxygen ($S O_2$) and as the atom of sulphur weighs twice as much as the atom of oxygen, the proportion by weight is pound for pound. It is produced by the simple process of burning sulphur in the air. When the temperature of sulphur is sufficiently raised it enters into combination with the oxygen of the air in the proportion to form sulphurous acid.

There are some serious objections to the employment of sulphurous acid in fumigating. It clings to the surfaces of the walls, and nestles among the fibers of clothing, and, when thus exposed to the atmosphere, each molecule, $S O_2$, absorbs a third atom of oxygen, becoming $S O_3$, which is sulphuric acid—oil of vitriol. This liquid, it is well known, is almost as destructive to clothing and other organic compounds as fire itself.

Were it not for this objection, nothing would be more easy than to rid vessels of rats and other small animals by burning a little brimstone in the hold. For this purpose carbonic acid would be equally efficient, and, after doing its work, it would all mingle with the air in its gaseous state, and be blown away with the wind. But the sulphurous acid produces that peculiar irritating effect upon the nostrils and lungs which is perceived in the burning of a friction match, and it would cause rats and mice to flee before its advance, while carbonic acid, being inodorous, would quietly kill the animals in their lurking places, where their bodies might become offensive in decay.

From the recent report of Dr. Elisha Harris, the learned Registrar of the Board of Health, it seems to be the general conclusion of chemists and physicians in Europe and America, that, by means of carbolic acid and sulphurous acid, both of those awful scourges, the rinderpest and the cholera, may be as completely controlled as small pox is by vaccination. This power of carbolic acid is one of the most beneficent discoveries of this fruitful century.

RANCID BUTTER FOR COOKING.

Many persons sneer at the common notion that butter too rancid to be eaten raw upon bread, may be used without objection in cooking; but this notion, like many other popular ideas, is more in accordance with the truth of the matter than the imperfect knowledge which ridicules it.

All fats are compounds of acids with glycerin. Butter is a mixture of several fats, and one of them, constituting, however, only a small portion of its mass, is butyrine; this is a compound of butyric acid with glycerin. Butyrine, like other fats, is a neutral substance, but when it is decomposed—in other words, when the butyric acid is separated from the glycerin with which it is combined—we then have the two substances, the acid and the glycerin, exhibiting each its peculiar properties. Butyric is a very powerful acid, caustic and sour, and having that peculiar strong odor which is characteristic of rancid butter. One of the early steps in the decay of butter is the decomposition of the butyrine, which is made manifest by the odor of the butyric acid set free, and by the sour and biting taste of this acid.

Now, at a temperature of 315 degrees, butyric acid is evaporated, hence it is only necessary to raise the temperature of the butter to this point in order to drive off the acid which makes it rancid, and to leave the remainder perfectly sweet. If rancid butter is mixed in cake, a portion of the butyric acid will be absorbed by the water in the cake, and it may not be all expelled by the heat in baking; but if the butter is used for frying in an open pan, it is pretty certain that the butyric acid will all be evaporated. With a knowledge of the properties of butyric acid, a skillful cook ought to be able to use rancid butter in such ways as to retain none of the rancidity in the cooked articles.

Preservation of Wood against Decay.

A correspondent furnishes us an interesting article on the above subject, which want of space this week obliges us to condense. We merely give the important parts. After speaking of the advantages of charring wooden posts before setting, he says:—Scientific men have explained this superiority to reside in the peculiarity of charcoal for absorbing the gases arising from decaying substances. But charcoal retains this property but a short time unless kept from the air. The reason of this lies in its limited absorbing power. In less than twenty-four hours after being set, the charcoal becomes saturated, and is then entirely ineffective for protecting the wood. The cause of the preservative influence must then be sought elsewhere, and the following is my belief:—The microscope reveals the cause of decay as due to parasites feeding on albuminous substances. Dr. Schmoele gives the following conditions, all of which must be fulfilled before decay takes place: The presence of parasites or germs, albuminoids, moisture, free oxygen, together with a suitable temperature, and the absence of greater counteracting influences. Now, charring wood dispenses with the first two conditions, for the heat required to char the outside coating is more than sufficient for decomposing the albuminous substances, and destroying all parasitic germs. A temperature but little above the boiling point would answer for this equally well. I come then, to the conclusion, that, for preserving wood, charring is quite superfluous, a much less heat answering equally well. On this idea, original I believe with myself, and which I claim as my invention, I base my plan for the preservation of wood. I propose to store the timber, of whatever description, in large stone or iron boxes or rooms through which I circulate currents of hot air or superheated steam, till each piece is heated to the required degree.

This process offers the following advantages: greater simplicity, greater cheapness, requiring no expensive chemicals, greater expedition of the work.

As is well known, the albuminoids are highly hygroscopic, and in consequence expand or contract with every change of moisture in the air. Wood treated as above is no longer subject to such changes.

American Steel.

A correspondent from Newark, N. J., complains of American steel as not being uniform. He claims that we have in this country as good material for making good steel as is to be found anywhere. But the same advertised qualities differ in a single case of the steel. Some of it is so hard that it will not bear more than a dull red heat, and then, when hardened, will break when driven into a piece of hard wood. There is no reason, except want of care and a proper knowledge of working steel, why we cannot make as uniform a quality of steel as is made in England. Success will come with patience and perseverance. We do not despair of seeing good American cast steel.

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FOR THE WEEK ENDING SEPT. 5, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

57,656.—HANDLE FOR BRUSH.—Albert Alden, New York City.

I claim the sleeve, B, which slides on the upper part of a handle, in combination with one or more notches, c, in the top edge of the lower hinged part, A, of said handle, constructed and operating substantially as and for the purpose described.

57,657.—AXLE BOX.—Samuel F. Allen, Chicago, Ill.

I claim, First, Securing oil cellars in place in their boxes by means of removable bottoms, which are constructed and applied substantially as described.

Second, The combination of the fixed pin, h, and the jam nut, g, with the hinged plates, C C, and a suitable cushion, which is interposed between said plates and the bottom of the oil cellar, substantially as described.

57,658.—CAR COUPLING.—John Bailor, Cannon City, Minn.

I claim the application to railway car couplings of wheel springs, swivel links, or shuckles, in combination and as herein described, and for the purposes specified.

57,659.—WOVEN FABRIC.—Seth W. Baker, Providence, R. I.

I claim the fabric above described, produced by combining, by means of the mode of weaving described, the body of the fabric formed wholly of cotton or linen, with a face or surface, the weft of which is woolen and which is interwoven with said body or central portion on one or both sides of the same, in the manner and for the purpose set forth.

57,660.—CULTIVATOR.—J. H. Barley, Longwood, Mo.

I claim the iron bars, D D, attached to the plow beams, A A, to support the cross piece, E, a suitable distance above the plow beams, in connection with the plow standards, F F, pivoted to the cross piece, substantially as and for the purpose specified.

I further claim the curved handles, K K, pivoted to the adjustable bar, J, and connected to the bars, F, which are pivoted in the bar, H, and secured to the plow standards, F F, substantially as and for the purpose set forth.

57,661.—RAILWAY SWITCH.—Charles J. Bayer, Poughkeepsie, N. Y.

I claim the connecting of the switch rails, C C, to the main and branch rails, A' B', by means of the bars, D D, substantially as shown, so that the switch rails will be adjusted or moved by the action of the car wheels on the bars, D D, as described.

In a railway switch, adapted to operate substantially as herein described, I further claim having the adjoining sides of the rails, A' B', and the bars, D D, beveled or inclined to form a lock for the bars, D D, as set forth.

57,662.—KNIFE AND FORK.—Frederick C. Beach, Stratford, Conn., and Alexander A. C. Klaucke, Washington, D. C.

We claim the combination with a knife or fork, of a receptacle for pepper, salt, or other condiment, in any manner, substantially as herein described.

57,663.—SOAP.—S. T. Beeler, Wales, Ill.

I claim the manufacture of soap by the combination of the ingredients in the proportion and manner substantially as herein specified.

57,664.—COUPLING JOINT FOR WELL-BORING SHAFTS.—L. Harrod Bell, Carmichaels, Pa.

I claim the device for preventing the two sections from separating by becoming unscrewed, namely, the mortises, h and i, bolt, D, and spring, E, all arranged and operated substantially as set forth.

57,665.—CATAMENIAL SACK.—Joseph C. Benzinger, Catonsville, Md.

First, I claim the expanded flap, M, extending backward from the trough of the sack so as to cover the nates and carry the straps, W W, beyond that part of the person, substantially as set forth.

Second, I also claim the sack made substantially as described, with a flap, M, and a trough, N, in combination with an elastic girdle, substantially as described.

57,666.—ARTIFICIAL LEG.—Douglas Bly, New York City.

First, I claim a set of springs, G G, in combination with the leg, A, and foot, B, forming a universal joint, substantially as specified.

Second, I also claim arranging the series of springs, G G, near the periphery of the socket, C, surrounding the center of motion, in such a manner that the central space will be left open, when said springs are employed between the foot and leg to produce reaction by compression, substantially as described.

Third, I also claim the arrangement of the plate, H, provided with the bearing, I, and the bolt, m, connecting with the spring, I, when used in communication with the toe joint, h, in such a manner as to work over it and produce the necessary leverage, substantially as set forth.

57,667.—GRINDING MILL.—Cornelius Bollinger, Harrisburg, Pa.

First, I claim mounting the fan, K, loosely upon the spindle, C, to adapt it to be rotated independently of the latter, substantially as and for the purposes set forth.

Second, I claim the driver, I, formed with an air passage or passages, 11, to enable the air from the fan to be discharged between the stones through the driver, substantially as described.

Third, I claim the combination with the hoop, L, of the circular plate, L', to form the ventilation passage, L2, as and for the purposes specified.

57,668.—CULTIVATOR.—J. W. Boosinger, Marine, Ill.

I claim, First, The clevis, D', and strap, D2, when constructed and employed substantially as described and set forth.

Second, The combination of the plow beams, D, with the clevis, D', also the combination of the said beams with the devices, E a a', a3, for the purposes and in the manner substantially as described.

67,669.—DRY HOUSE.—John K. Boswell, Richmond, Ind.

I claim, First, The rectangular heater, G, when the same is provided with the cylindrical valves, H H', as and for the purposes set forth.

Second, The combination of the rectangular heater, G, the valves, H H', the openings, K K', and the connecting pipe, b', all arranged and operating substantially as and for the purposes set forth and described.

Third, The arrangement of the movable lattice platform, F, and rectangular heater, G, and valves, H H', substantially as set forth.

57,670.—REFRIGERATOR BUILDING FOR PRESERVING FRUIT, ETC.—James A. Boyer, Greensburgh, Ind.

I claim, First, The combination and arrangement of the pipes, B B, situated one in the lower, the other in the upper part of the chamber, C, the bellows, D, or its equivalent, situated as described, and the series of V-shaped air passages under the ice chambers, so that the air will be drawn from the lower part of the chamber cooled by the condenser, and forced into the upper part of said chamber, substantially as described.

Second, In combination with the above parts, I claim the absorbing chamber, G, constructed and operating as described.

Third, The construction and arrangement of the cooling or condensing apparatus as shown, to wit, having a series of ducts or air passages, a a, inclined in V form, and placed underneath the ice chamber having a V-shaped bottom, the whole being constructed and operating substantially in the manner and for the purpose set forth.

Fourth, The arrangement of the absorbing chamber as shown, to wit, having said chamber provided with a partition plate, e, and pipe, H, constructed and operating substantially as described.

Fifth, In combination with the pipes, B B, or chambers, b* c*, connected therewith for ingress or egress of the air, I claim a thermometer and barometer for the purposes described.

57,671.—ORGAN REED.—A. M. Brush, Clayton, N. Y.

I claim an organ reed made of silver either alone or mixed or alloyed with one or more metals.

57,672.—PORTABLE FENCE.—George S. Carlisle, Columbus City, Iowa.

I claim the arrangement of the braces, F F, and end posts, A, relating to each other and operating in the manner and for the purpose herein described.

57,673.—ELECTRIC TELEGRAPH.—Alonzo Chace, Syracuse, N. Y.

First, I claim in combination with the devices above shown for breaking the electric connection upon a telegraph line, that is to say, the block, N, and its appurtenances, and the connecting pole, X, and its appurtenances, made and applied substantially as above set forth.

Second, I also claim the block, N, and its spring, T, in combination with the wires that compose a line of telegraph, substantially as above set forth.

57,674.—WELL TUBE.—John Chandler, Cold Water, Mich.

I claim the perpendicular loop rods, a a, as described in combination with the wire gauze tube, d d, inside supporting spiral coil, e e, cone point, c, and tube, A, substantially as and for the purposes set forth, thereby adding great strength and security to the lower tube.

57,675.—DEVICE FOR FASTENING THE SLATS OF VENETIAN SHUTTERS.—George L. Chapin, Chicago, Ill.

I claim the arrangement and combination of the plate, F, bolt, J, screw, C a, and the notched band, K, substantially as set forth and described.

57,676.—CORN PLANTER.—Barnabas Clark, Mackinaw, Ill.

First, I claim the clutch, G, in combination with the axle, F, cells, c, wheel, B B', arranged and operating in the manner and for the purpose herein specified.

Second, The marker, P, when applied to or used in combination with the loose axle, F, substantially as and for the purpose specified.

Third, The attaching of the openers, J, and colters, L, to the bars, K K', applied to the frame, A, and connected with a foot bar, O, substantially as and for the purpose set forth.

Fourth, The ratchet, Q, on the loose axle, F, in connection with the pawl, R, attached to the lever, S, whe said parts are used in combination with the maker, P, and the seed-distributing device, all arranged substantially as and for the purpose specified.

57,677.—ATTACHING KNIVES TO THEIR HANDLES.—William Clayton, Bristol, Ct.

I claim the recessed bolster, a, of the blade, A, in combination with the tang, D, and nut, d, arranged with the ferrule, c, guard, C, and handle, B, in the manner and for the purpose herein specified.

57,678.—MACHINE FOR CUTTING STALKS IN THE FIELD PREPARATORY TO PLOWING.—G. W. Cole, Canton, Ill.

First, I claim the combination of a cylinder of cutters, O, and its supporting frame, I, with the main frame, A, when said frame, I, is hinged at its rear end to the frame, A, and has a vertical adjustment at its front end, operating substantially as and for the purpose set forth.

Second, The hook, m, constructed as described in combination with the hanging posts, J, arranged substantially as and for the purposes set forth.

Third, The notched or toothed open standard, Q, lever, S, spring catch, e, rod, g, and staple, h, in combination with the frames, A and I, all substantially arranged as and for the purposes set forth.

Fourth, The levers, r, and rods, p, in combination with hooks, m, arranged substantially as and for the purposes set forth.

Fifth, The spring fulcrum, S, in combination with the frame, A, and lever, r, arranged substantially as and for the purposes set forth.

Sixth, The curved arms, y, and lever, w, as described, in combination with the levers, r, and catch, q, all arranged substantially as and for the purposes set forth

57,679.—WASHING MACHINE.—Thomas Cole, Marshalltown, Iowa.

I claim, First, The yielding lever, A A, as applied to the washing machine, substantially as herein described.

I claim the fulcrum wedge, K, in connection with the yielding lever, A A, as applied to the washing machine, substantially as herein set forth.

57,680.—FILE-CUTTING MACHINE.—Henry B. Comer, Pittsburgh, Pa.

First, I claim moving the file blank and its bed through the medium of the cutting tool by means substantially as herein described and for the purpose set forth.

Second, The adjustable lifting arm, m, when used in combination with the lifter, 3, hammer, f, mandrel, d, and cutter, 9, as herein described and for the purpose set forth.

Third, The tool holder, B, provided with spring, o, set screw, 5, and piece, e, for holding the mandrel, d, said holder being used in combination with the lever, 10, spring, g, lifter, n, cam, 1, eccentric lifter, 2, constructed, arranged, combined and operating substantially as herein described and for the purpose set forth.

57,681.—CLOTHES DRIER.—J. C. Connor, Dover, N. H.

I claim the bars, V W X, constructed as described in combination with each other with the horizontal bars, C I J and Y, and with the end pieces, A B F G, of the clothes drier, substantially as described and for the purpose set forth.

57,682.—APPARATUS FOR GENERATING GAS.—Mathias P. Coons, Brooklyn, N. Y.

I claim the internal arrangement of the retort, B, with the cylinder, D, and in the lamp, Fig. 4, the wick tube, J, and also the connecting tubes as arranged, marked I, L.

I also claim the application of the safety valve, I, for the purpose and in the manner described and in combination therewith the application of the stop cock, in the manner and for the purpose described.

I also claim generating gas from volatile fluids by introducing the same into a generating retort by capillary attraction, for the purpose and in the manner herein set forth and described.

57,683.—BAG HOLDER.—Gilbert C. Corbin, St. John's, Mich.

I claim the arrangement of the board, a, and expanding holders, m n, operating substantially as described and represented.

57,684.—TWEER.—F. A. Deutenberg, Pittsburgh, Pa.

First, I claim the vertical center blast blacksmith fire tewel or tweer, having the chamber, H, with its dome, E, in which is the hole, J, and an annular channel K, at its top part, substantially as and for the purpose specified.

Second, The bend upward, B C, of the pipe, A, in combination with the receiver, H, dog, E, and door, G, as described and for the purpose specified.

57,685.—FRUIT GATHERER.—Alonzo R. Dinsmore, Auburn, N. H.

I claim the improved fruit gatherer made substantially as described, that is as consisting not only of the hole, the padded annular and disk jaws, and mechanism or means for opening and closing the disk jaw, but of the cloth or flexile conductor and the tubular cushion, arranged as specified.

57,686.—APPARATUS FOR CARBURETING AIR.—Silas R. Divine, New York City.

I claim the use of the chambers, B B B B, when placed one within another and composed of porous or perforated walls, substantially as described.

57,687.—GALVANIC BATTERY.—Joseph Dixon, Jersey City, N. J.

I claim, First, The combination in a galvanic battery of the porous diaphragm and negative metal or element in one and the same cell, substantially in the manner and for the purposes hereinbefore described.

Second, The graphite cell composed of pure plumbago and clay, or other material of which plumbago is the conducting ingredient, when combined in the proportions, substantially as hereinbefore stated.

57,688.—GANG PLOW.—James W. Donaldson, Daniel Sheets and Allen C. Miller, Suisun, California.

We claim the peculiar construction of the frame in order to obtain sufficient strength for a number of plows by placing the diagonal bars, A2 A3, between the parallel bars, A' A1, and the cross braces, a a1, substantially as described.

Second, The manner of attachment of the plows to their respective portions of the frame by means of the bent braces, C C C C, passing over the top of said frame-work as herein shown in combination with the plows, substantially as described.

Third, The adjustable wheel, E, and scraper, f, with the wheels, G G, scrapers, N H, also the turn plates, H H, and connecting rods, h h1, with upright bars, J J, jointed at the turn plate, H, in combination with the sweep L, substantially as described and for the purpose set forth.

57,689.—BRICK MACHINE.—Richard A. Douglas, Chicago, Ill.

I claim, First, The combination of the series of grinding rollers, a and a', being so geared that one of each pair shall revolve faster than the other with the hopper, d, and the charger, G, when arranged to operate as shown and described.

Second, I claim the charger, G, provided with the chamber, g, and the lubricating reservoir, h, arranged to operate in connection with the hopper, d, substantially as set forth.

Third, I claim the plungers, 1 2 3, and arranged to operate in combination with the molds, J, and the followers, 1' 2' 3', etc., when said plungers and followers are operated by the cams, l m and n, as shown and described.

Fourth, I claim the arrangement of the cam wheels, N, and the accompanying mechanism for operating the charger, G, as set forth.

Fifth, I claim the means substantially as shown for adjusting the hight of the plate, L, and its followers.

Sixth, I claim the means of adjusting the movements of the charger, G, by means of the slotted arm, r, and pin v, substantially as shown and described.

57,690.—PROPELLER FOR STEAMSHIPS.—Arthur Doyle, New York City.

First, I claim the combination of the vertical buckets, a a, with the side beams, b b, the upright arms, c c, the radial arms, h j, and the crank, e, with the shafts, f, as applied either to the side or stern of a ship in connection with the system of balance beams and oscillating bars, constructed, arranged and operated substantially as and for the purposes herein described.

Second, I claim also the combination of the buckets, a', a', with the side beams, b' b', the main central upright arm, c', and the half arms, c2 c2, the radial arms, h' j', and j2, the slide, z, and the crank, e', with the shaft, f', as applied to the side of a ship in connection with the system of balance beams and oscillating bars, constructed, arranged and operated substantially as and for the purposes herein described.

57,691.—ARTIFICIAL LEGS.—John S. Drake, New York City.

First, I claim the malleable cast metal frame for artificial limbs formed in the manner and for the purpose specified.

Second, I claim the straps, i i, of the cast metal frame, A, applied in the manner and for the purposes set forth.

Third, I claim the spring metallic frames for the toes, each attached by a separate rivet or screw so as to be movable, as set forth.

Fourth, I claim the curved metal spring, n, introduced at the ankle joint, with its ends attached to the heel, D, and frame, C, and acting to keep the toes of the foot from dropping, as set forth.

57,692.—OPERATING ORDNANCE.—James B. Eads, St. Louis, Mo.

I claim the combination of a pair or more of gun carriages so connected as to preserve the parallelism of the axes of the guns with a corresponding number of curved tracks so arranged as to cause the said axes to vibrate upon a given point in the embrasure, substantially as described.

57,693.—DEVICE FOR TRANSMITTING MOTION.—Thomas C. Entwistle, New York City.

I claim the combination and arrangement of three bevel gears C D E, and a revolving yoke, F, or its equivalent, to operate substantially as herein specified.

57,694.—NECK-TIE SUPPORTER.—J. A. Eshleman, Philadelphia, Pa.

I claim the holder composed of the plate, a, and arms, b and b', the whole being constructed and arranged for the reception of a scarf, substantially as and for the purpose described.

57,695.—LUBRICATING BUSH.—S. H. Everett, Milton, Ohio.

I claim the lubricating bush D, having orifices, n, n, or their equivalents, when used in carriage boxes or in bearings for machinery in the manner substantially as described and for the purposes specified.

57,696.—STEAM CARRIAGE.—Mathew Fletcher, Louisville, Ky.

First, I claim the application of a rotary steam engine to each propelling wheel, for stability of carriage, avoiding dead centers, and enabling the driver to have at his command with ease, and by the power of steam to back, turn or advance.

Second, I claim the arrangement of the engine, piston and wheel operating together (or independently), with the piston and wheel on the opposite side of the carriage, for the purpose set forth.

Third, I claim suspending the whole weight of carriage and engine to the axle.

57,697.—TURNING ON AND SHUTTING OFF GAS BY ELECTRICITY.—Samuel Gardiner, Jr., New York City.

First, I claim the wheel D, provided with the non-conducting and conducting surfaces substantially as described, and rotated by a crank whose revolutions are registered by or upon a dial, substantially in the manner and for the purpose described.

Second, I claim the dial with its light and dark segments or portions to indicate in connection with a certain opening or place on the dial plate or other fixed object, the position of the stop-cock or other object for the movement of which the apparatus is designed substantially as described.

Third, I claim the revolving arm and spring tooth, M, m, operating in connection with the stud, c', or its equivalent, to rotate the wheel, D, by engagement with the cogs thereof, as described.

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Fourth, I claim the combination of the shaft, D, wheel, D, spring tooth, m, arm, O, and spring detent, N, as and for the purpose described.

Fifth, I claim the arrangement of the key, G, and spring keys, g g' g'', with the portions, d d' d'', constituting the wheel, D.

Sixth, I claim the arrangement of the shaft, B, studs, r r, wheel, s, and detent, S, the pinion, T, spur wheel, U, and dial, V, operating substantially as and for the purpose described.

57,698.—Farm Gate.—Francis Gay, Bedford, Ohio.

First, I claim the shaft, D, arms, H and J, and gate, A, when the several parts are combined and operate as and for the purpose set forth.

Second, I claim the standard, D, face plate, E, and wheel, G, in combination with gate, A, as and for the purpose specified.

57,699.—Cultivator.—William Geahr, New Holland, Pa.

I claim the independent, adjustable and reversible beams, D D, in combination with the upright, E, F, when connected with a suitable frame work, substantially in the manner and for the purpose specified.

57,700.—Cultivator.—George T. Gifford, Monmouth, Ill.

First, The arrangement of the frames, B and A, and movable pivot, L L, for balancing, substantially as described.

Second, The combination of the lever, F, cross bars, E and C, and plows, G G, with the inside frame, for the purposes set forth and substantially as described.

Third, The arrangement of frames, B B and A A, by which the weight of driver supports or tends to lift plows, substantially as described.

Fourth, The slide, s, operating in the axles, as described and for the purpose set forth.

57,701.—Smelting Furnace.—John L. Gill, Jr., Columbus, Ohio.

I claim constructing a cupola or smelting furnace in such a manner as to allow of a part of the upper portion (of such cupola or smelting furnace), being made from a hollow steam boiler for generating steam to be used in the production of a blast, or for any other purpose as described above.

57,702.—Cap.—Simon Goldstone, Philadelphia, Pa.

I claim a cap having a series of eyelet holes through the back, opening from the exterior into the space contained between the body and the band, and series of eyelet holes through the band, opening from the interior of the cap into the same space and having an oil silk perspiration shield, the whole arranged and operating with respect to each other, substantially as is herein specified and described.

57,703.—Mop and Scrubber.—William T. Grant, Jacksonville, Ill.

I claim the combination of the brush head, A, the rubber head strip, B, mop, F, handle, C, bar, E E, cylinder, D, catch or pin, o, and arm, g, as and for the purposes set forth.

57,704.—Lock.—James T. Guthrie, Leesburg, Ohio. Antedated August 17, 1866.

I claim, First, The two bolts, B and B', having spring cheeks, C and C', pin, d, and springs, b and b', arranged and operating as above described and set forth.

Second, Guard bolt, D, sliding incline, D', lever, F, spring, G, and catch spring, i, constructed as above described and for the purpose set forth.

57,705.—Shears for Cutting Bolts.—Jones Guthrie, Wilmington, Del.

I claim the combination of the parallel levers, A A, the joint, B, with the connecting plate, E, and movable knife, G, operating against an opposite knife, J, and the set screw, L, all constructed and arranged as herein described, for the purposes set forth.

57,706.—Hay Rake.—E. R. Hall, Ilion, N. Y.

I claim, First, The suspending or fitting of the rake, G, between swinging bars, F F, connected to the front end of the frame, A, and having an arm, H, connected with the rake head, substantially as and for the purpose set forth.

Second, The lever, I, fitted within the arm, H, in connection with the pins, f f, on the rake head, c, when said parts are applied to a suspended rake, G, substantially as and for the purpose specified.

Third, The lever, L, on the axis, J, provided with the arm, g, connected with the arm, H, by a chain, K, in combination with the pawl, M, attached to lever. L, and the rack, N, secured to a board on the front part of the seat supports, a a, substantially as and for the purpose specified.

57,707.—Combined Sower and Drill.—George W. Hall, Augusta, Mich.

I claim, First, The pendent frames, M, carrying furrowing wheels, S, drills, N, for the purpose substantially as described.

Second, I claim a machine for sowing different kinds of grain, when provided with pendent frames, carrying the furrowing wheels and drill tubes, substantially as and for the purposes herein set forth.

Third, The combination and arrangement of the levers, J K V and Y, connected to the slides in the seed box, L, and agitator, X, in the box, O, with the elbow lever, D, and cam, c, all for the purposes and substantially as herein set forth.

Fourth, I also claim the plows when constructed and operated as herein shown.

57,708.—Manufacture of Artificial Fuel.—William Halsted, Trenton, N. J. Antedated August 10, 1866.

The combination, mixture and treatment of the ingredients above mentioned, substantially as above described and intended to produce the same effect.

57,709.—Folding Chair.—E. Hambujer, Detroit, Mich.

First, I claim the head part, D, having legs, E, in combination with the parts, C B, hinged to each other and with frame, A, provided with pivoted legs, F, and braces, f', arranged and operating substantially as represented and described.

Second, The screw socket, C, in combination with the legs, F, and frame of the part, B, substantially as described and for the purpose set forth.

57,710.—Grain Binder.—Henry Harrier, Indianapolis, Ind.

I claim the cylinder, V, with its square shaft, W, the grain gatherer, T, and the concave, U. I also claim the combination of the spring, a, with the arrangement, L, and the lever, R.

57,711.—Illuminated Sign.—James Harrison, New York City.

I claim the combination of the close glass cups, C, with the block or raised work, B, of the letters or devices to be shown, and with the back ground, A, substantially as herein described and for the purpose set forth.

57,712.—Power Loom.—Philo W. Hart, Stamford, N. Y.

First, I claim the sliding plate, f, applied to work through the lay of the loom, and in combination with the movable trap at the bottom of the shuttle box, substantially as and for the purpose herein described.

Second, The fingers, w w, attached to the lay of a loom and operating in combination with the movable trap at the bottom of the shuttle box, substantially as and for the purpose herein set forth.

Third, The spare shuttle box, I, attached to a breast beam or framing of the loom, having a movable trap at its bottom and operating in combination with a shuttle box having a movable trap at its bottom on one side of the lay, substantially as and for the purpose herein described.

Fourth, The combination of the spare shuttle box working on fixed brackets, J J, or their equivalent attached to the breast beam or other fixed portion of the loom, the rock shaft, K, carrying the fingers, w w, and furnished with a pin, z, and the stationary arm, L, the whole operating substantially as herein set forth.

Fifth, The sliding plates, N M, in combination with each other with the lay and one of the shuttle boxes thereon, and with the spare shuttle box, substantially as and for the purpose herein described.

57,713.—Gate.—B. S. Healy, Cohocton, N. Y.

First, I claim the curved metallic strip, K, in combination with the notched top rail of the fence with the gate post, B, and with the perpendicular support, L, substantially as described and for the purpose set forth.

Second, The combination of the supporting piece, O, with the gate post, B, the perpendicular support, L, and with the shortened bottom rail, G, of the gate, substantially as described and for the purpose set forth.

57,714.—Raking and Binding Attachments to Reapers.—Marshal D. Higley and Dana L. Columbia, Morristown, Ill.

We claim in an automatic rake for a harvester the combination of the eccentrics, D and E, connecting rods, G and D2, bell crank, G1, and oscillating rake arm, H, said parts being respectively constructed substantially as described.

Second, The oscillating rake arm, H, and parallel rod, H1, adjustably attached to the levers, H2, when used in combination with the eccentric, D, and connecting rod, D2, substantially as set forth.

Third, We claim the wheel, I, with the track, I2, and depressions, I3 and I4, when used for actuating the levers, N1 and M3, respectively, substantially as and for the purpose set forth.

Fourth, The twist head, L, when constructed in two parts, L1 and L2, the part, L2, being arranged to turn on a pivot, the opposed faces of the parts being perpendicular to the axis of rotation, and the said parts being constructed and arranged substantially as set forth.

Fifth, In combination with the twist head, L, we claim the clutches, N N, attached to levers, N1 N1, which have their fulcrums near the center, and are opened and closed by a spring, O, and cam, I, substantially as set forth.

Sixth, In combination with the twist head, L, we claim the nippers, M M1, one being fixed and the other movable, when they are respectively constructed and the movable one actuated substantially as set forth.

Seventh, In combination with a device for binding the sheaf, we claim the revolving arm, R1, for throwing the sheaf from the platform, substantially as set forth.

Eighth, We claim the cam, C, having a dead point, a b, when used in combination with, and for the purpose of giving motion to, the binding arm, G, substantially as set forth.

Ninth, The shield, U and U2, when used in combination with an automatic binding mechanism, substantially as and for the purpose set forth.

57,715.—Guard for Railway Crossings.—Asa Hill, North Providence, R. I.

I claim an improved safe-guard or barrier for railroad crossings, composed of a bar applied to uprights at each side of the roadway in such a manner that the bar may be raised or lowered by means of cranks or pivoted arms in the manner substantially as herein shown and described.

57,716.—Turning Lathe for Turning Scythe Snaths.—Spencer Hinton, assignor to Withington, Cooley & Co., Jackson, Mich.

First, I claim the two plates, G H, with hollow bugle-mouthed journals, J J, respectively on each, and a pulley, P, on one, G, fastened together in such a position with the pieces, L L, between them, and diametrically opposite to each other, so that the journals, J J', will be in a line with each other, and retain certain gage and knife holders between them, substantially as and for the purpose specified.

Second, The two gage and knife holders, B B, moving toward and from the center of rotation between the plates, G H, substantially in the manner as and for the purpose set forth.

Third, I claim so fitting the ends of gages where the parts of the circle pass each other (when the gages are closed up, as in Fig. 1) into each other, that as they open they will tend nearer to form a complete circle, and when fully open the circle will be complete, as shown in Figs. 3 and 4.

Fourth, I claim attaching the knife and feed knife to gage and knife holders, as herein described.

57,717.—Loom.—Isaac N. Hodson, Mount Pleasant, Iowa.

First, I claim the cranks, a a', two or more, and cam rollers, F, in combination with the batten, G, and heddle frames, E, constructed and operating substantially as and for the purpose set forth.

Second, The combination of the supporting piece, O, with the gate post, B, the perpendicular support, L, and with the shortened bottom rail, G, of the gate, substantially as described and for the purpose set forth.

57,718.—Wood-boring Machine.—David Hoit, Fort Wayne, Ind.

First, I claim the auger shaft, G, shafts, C and D, and guide posts, B and B', arranged and operating as described.

Second, The shaft, L, screws, J J', nuts, m m', and yoke, M, as and for the purposes set forth.

Third, The arrangement and combination of the parts herein described for giving the auger of a boring machine a perpendicular and horizontal motion independently or simultaneously, in the manner and for the purposes herein set forth.

57,719.—Cultivator.—Jacob Hollinger, Millersburgh, Ohio.

I claim the herein described construction of cultivators, consisting of the beam, A, curved bars, B B, braces, D, shears, C B' B', and handle, E, several parts being constructed, arranged, and operating as and for the purpose set forth.

57,720.—Bed Bottom.—E. F. Holloway and J. W. Hudelson, Knightstown, Ind.

We claim, in combination with the rails, A, the strips, C, springs, B, and removable slats, D, the said several parts being respectively constructed and the whole arranged for use substantially as set forth.

57,721.—Apparatus for Preserving Milk.—Noah P. Holmes, Indianapolis, Ind.

I claim the can, 1, with its double lining, 77, for charcoal, its cylinder with ice, 5, separate lids, 24, and ventilators, 33, for the purpose described, and all arranged substantially as set forth.

57,722.—Truss.—T. L. Hough, Philadelphia, Pa.

I claim the combination of the hub, D, spring, m, arm, B, and journal, a, arranged to operate as and for the purpose herein set forth.

57,723.—Stand and Mirror.—W. H. Hughes and H. L. Lent, Peekskill, N. Y.

We claim a combined toilet stand, or its equivalent, and mirror, when the latter, by its staff or rod, H, is hung or suspended to the said stand by means of a cord, J, pulley or pulleys, K, and weight M, substantially as described and for the purposes specified.

57,724.—Plow.—Herbert A. Hummer, Franklin Township, N. J.

I claim uniting the mold board and land side of the plow by a concealed joint, constructed and arranged substantially as and for the purpose described.

57,725.—Plate for Artificial Teeth.—George H. Hurd, St. Louis, Mo.

I claim the plate, B, when constructed with the flanges, b, either with or without the suction cavities, b1, so that artificial teeth may be fitted into mouths of bad formation, and secured there, either by suction, or by muscular power, or by both.

57,726.—Dental Mold.—George H. Hurd, St. Louis, Mo.

I claim constructing dental molds, or impression frames, A, so that their edges, b and b', will be wide enough apart to take an impression of the lip muscles and tongue shelf at the same time, substantially as herein described and set forth.

57,727.—Burning Fluid.—John Jann, New Windsor, Md.

I claim the combination of benzine, sweet oil, and oil of vitriol, in about the proportions and for the purpose described.

57,728.—Manufacture of Pot and Pearl Ash.—Benjamin F. Jewett, Malone, N. Y.

I claim the process of manufacturing pot ashes and house ashes into pearl ashes, by the use of black muck, substantially as herein specified.

57,729.—Apparatus for Carbureting Gas.—Algenon K. Johnston, New York City.

I claim the use of the materials above described, for the purposes set forth.

57,730.—Churn.—J. D. Kellogg, Jr., Northampton, Mass.

I claim the dasher provided, the opening, b, and the inclined surfaces, a c, sloping in different directions, and operating as described.

57,731.—Fruit Gatherer.—Zebalon S. Kelsey, Huntingdon, Ohio.

I claim the construction and arrangement of the fruit gatherer, as herein set forth.

57,732.—Car Coupling.—John Kingsbury, Ravenna, Ohio.

First, I claim the arrangement of the jaws, C, when pivoted together, and to the adjustable stay, B, in combination with the standard, E, springs, J D, chain, F, and windlass, as specified.

Second, The hook, D', and adjustable stays, K, when arranged and pivoted, as set forth, in combination with the spring, N d, and jaws, C, as and for the purpose set forth.

57,733.—Sash Lock.—D. P. Lacey and J. A. Bartlett, Oxfordville, Wis.

We claim the combination and arrangement of the tumbler, a b f h, lock bolt, d j k, and spring, m and e, substantially as and for the purpose set forth.

57,734.—Corn Planter.—Alexander Ladd, St. Lawrence, N. Y.

I claim the slide, B, provided with a hole, c, in combination with the box, A, and the hole, f, in the bottom, c, thereof, when said parts are arranged as shown and described, to admit of the dispensing with the ordinary strike or cut-off; for depriving the hole, e, of superfluous corn or seed, as set forth.

Second, I further claim, in combination with the box, A, and slide, B, arranged as shown, the false bottom, E, having its lower end beveled or chamfered at its under side, substantially as and for the purpose specified.

57,735.—Fence.—Charles Lee, Winchester (Sandy P. O.), Ohio.

First, I claim the posts, A, when constructed substantially as herein described and for the purposes set forth.

Second, The combination of the loops, C, when constructed as herein described, with the posts, A, and boards, B, substantially as and for the purpose set forth.

Third, The combination of the key or wedge, E, with the posts, A, loop, C, and boards, B, substantially as described and for the purpose set forth.

57,736.—Machine for Tenoning Spokes.—James Lefeber, Cambridge City, Ind.

First, I claim supporting the gear frames, P or j, upon the movable frame, S, and providing for their vertical adjustment thereon, substantially as described.

Second, I also claim, in combination, the movable frame, S, the gear frame, P, and the carriage, D, substantially as described.

57,737.—Lubricating Oil.—Joseph M. Lippencott, Pittsburgh, Pa.

First, I claim the reduction of the gravity of hydrocarbons, or petroleum oil, by the admixture of pine tar, substantially as above set forth.

Second, I claim the use of pine tar in the manufacture of lubricating oils of any desired gravity, in combination with hydrocarbons or petroleum.

Third, I also claim the use of pine tar, in the manufacture of lubricating oils, in combination with hydrocarbons or petroleum, animal oils, tallow, or fatty matter of any description.

57,738.—Barrel for Petroleum, etc.—John S. Lipps, Brooklyn, N. Y.

I claim a barrel, for hydrocarbon liquids, provided with an air pipe, c, and escape orifice, a, substantially as and for the purpose described.

57,739.—Grain Binder.—Sylvanus D. Locke, Janesville, Wis.

First, I claim the combination and arrangement of the part, C, pitman, O, constructed substantially as described, crank, t, shaft, A, standard, J, and head, Y, when the whole are constructed, arranged, and used, substantially as and for the purpose set forth.

Second, The combination and arrangement of the part, C, pitman, O, constructed substantially as described, shaft, A, standard, J, and head, Y, and shaft spring, F, when the whole are constructed, arranged, and used, substantially as and for the purpose set forth.

Third, The combination and arrangement of the part, C, pitman, O, projection, m, cylinder, B, pin, D'', shaft, A, crank, p, standard, J, and head, Y, when the whole are constructed, arranged, and used, substantially as and for the purposes set forth.

57,740.—Washing Machine.—M. J. Lourrentz, Leavenworth, Kansas.

First, I claim the reciprocating rubber, I, operated from a rock shaft, J, as shown, in combination with the pressure rollers, C, arranged with springs, E, connected with adjustable bars or slides, F, substantially as and for the purpose herein set forth.

Second, The pounder, M, connected with the rock shaft, J, through the medium of the tubular rod, N, sliding rod, O, and spring, P, substantially as and for the purpose specified.

Third, The operating of the rock shaft, J, through the medium of the toothed segments, m n, counterpoised lever, K, and hand lever, L, all arranged substantially as described.

57,741.—Fruit Picker.—C. M. Lunt and W. F. Lunt, Biddeford, Me.

We claim an instrument for picking fruit, constructed and operating substantially as shown and described, that is to say, we claim the combination of the handle, A, rod, B, tines, d, spring, b, cords, e, apron, C, and basket-supporting hooks, f, substantially as shown and described.

57,742.—Slop Hopper.—John Marguis, San Francisco, Cal.

First, I claim the construction and arrangement of the stationary hopper, E E, and movable hopper, D D, substantially as described, and for the purpose set forth.

Second, I claim the bowl or pan, G A', or its equivalent, placed upon standards in the bottom of the lower legs, in the outer hopper, or attached to the inner hopper, D, and which forms, together with the lower portion of the movable hopper, and the upper portion of the connection pipe, I, the trap, A'' A'', substantially as described, and for the purpose set forth.

Third, I claim arranging the inner hopper in the stationary or outer hopper, so as to form the upper trap, A, as herein specified and for the purpose set forth.

57,743.—Metal Frame for Pianos.—Martin Martins, New York City.

First, I claim the tension screw rods, h, and springs, j, in combination with the frame, A, constructed and operating substantially as and for the purpose described.

Second, The L-shaped plank, i, in combination with the lips, e f, of the frame, A, and with the tension screw rods, h, constructed and operating substantially as and for the purpose described.

57,744.—Railroad Switch.—H. Maxel, E. Fessler, and H. Fessler, Canton, Ohio.

First, We claim the switch box, A, with inner box, N, and windows, C D, with signal, T, arranged in the manner substantially as and for the purposes set forth.

Second, The semi-circular wheel, E, wheel, R, wheel, H, crank, K, lever, J, and spring, b, arranged within the switch box, A, as and for the purposes herein specified.

Third, The shaft, M, attached to the wheel, E, by means of the arm, P, and metallic plate, e, working the rod, F, when arranged and used as and for the purposes set forth.

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57,745. — CARRIAGE GEARING.—J. R. McAllister, Richville, N. Y.

First, I claim the brace rods, G G2, secured to the wagon body at one end and at their others respectively to the hind axletree and the head block, E, of the front spring of the said body, substantially as and for the purpose described.

Second, The swinging frame circle, O, o the front head block, E, in combination with the plate or circle, P, fixed to the front axletree, the two being connected together, substantially as described and for the purpose specified.

57,746.—REFRIGERATOR FOR LIQUIDS.—Robert W. McClelland, Springfield, Ill.

I claim a refrigerator for cooling ale, beer, and other liquids, arranged so that the casks may be supported upon slides, E, resting upon the ways, D, in the upper part of the chest, A, and the liquids be conducted by a flexible pipe, G, into a receiver, I, inclosed in the cooling tub, H, and then drawn for use through a faucet, m, passing through the small doors, O, said several parts being constructed and arranged substantially as set forth.

57,747.—GUARD ATTACHMENT FOR CULTIVATORS.—Thomas B. McConaughey, Newark, N. J. Antedated Aug. 28, 1866.

I claim the application of a guard or guards to a cultivator, substantially in the manner as and for the purpose herein set forth.

I also claim the pivoting the bar, F, to which the plate or guard, G, is attached between plates, E E, secured to the cultivator near its front end and provided with a rest, b, substantially as described.

57,748.—PLOW.—John McKinley, Bethesda, Ohio.

First, I claim the point, e, constructed substantially as described.

Second, The combination of the point, e, with the share, c, colter, b, and mold board, a, substantially as herein set forth.

57,749.—BURNING FLUID.—G. H. Mellen and J. C. Hazleton, Washington, D. C.

We claim an illuminating oil composed of the several ingredients named and of the proportions, substantially as set forth.

57,750. — CHURN. — Jacob H. Mendenhall, Cerro Gordo, Ind.

First, I claim the combination of the dasher, H, shaft, G, adjustable gear wheels, E and F, crank shaft, I, and crank or cranks, D, with each other and with the box, A, and cover, C, when said parts are constructed and arranged substantially as herein described and for the purposes set forth.

And second, The combination of the gathering board, J, and spring catch, K, with the dasher shaft, G, substantially as herein described and for the purposes set forth.

57,751.—REVOLVING ORDNANCE.—Nathan L. Milburn, St. Louis, Mo.

I claim, First, The arrangement of the radiating series of barrels to revolve upon a central pin, b, furnished with trunnions, c c, and applied to operate substantially as herein specified.

I claim, Second, The combination of the curved bar, L, the screws, M M, the rock shaft, K, and the clamps, p q, the whole applied in combination with the barrels and carriage, to operate substantially as herein set forth.

57,752.—CORN CULTIVATOR.—L. B. Moore, Janesville, Wis.

I claim the construction of a corn cultivator, by the combination and arrangement of the various parts, substantially as they are described in the foregoing specification, or their mechanical equivalents, when used to produce the said automatic reciprocating motion of the said levers, J J, and shovels, X X, as specified.

57,753.—MACHINE FOR SHAVING HOOPS FOR CASKS.—J. G. Morgan, Colton, N. Y.

I claim, First, The combination of the stationary bar, C, the pivoted bar, E, the knives, H, levers, J and L, and gage, K, substantially as herein described and for the purpose set forth.

Second, The combination of the inclined slotted table, M, the nippers, o, the sliding block, P, strap, S, clutch, t V, lever, W, and drum, T, on shaft, U, with the stationary and pivoted bars, C and E, substantially as herein described and for the purpose set forth.

57,754.—GRINDING MILL.—Ellis Nordyke and Addison H. Nordyke, Richmond, Ind.

We claim the herein-described metallic eye for millstones, when constructed and operating as described.

57,755.—TOOL FOR WORKING WOODEN LEGS.—Edwin Osborne, Philadelphia, Pa. Antedated Aug. 23, 1866.

I claim the plug, D, in combination with the burr cutters, constructed, arranged, and operating substantially in the manner and for the purpose specified.

57,756.—BORING TOOL FOR MAKING WOODEN LEGS.—Edwin Osborn, Philadelphia, Pa. Antedated Aug. 23, 1866.

I claim the combination of the O G, or curved blades, H, with the burr or other cylindrical cutter for forming the orifice in the ankle portion of the artificial legs.

Also, the combination of the head piece, I, with the curved blades, H, and burr, E, for insuring perfect uniformity in depth and gage of cavity, substantially as described,

57,757.—EARTH SCRAPER.—Nelson Peck, Jay, N. Y.

I claim, First, An improved scraper formed by combining the lever, G, bars, F, bars, L, levers, J, and bars, K, with each other and with the frame, L, tongue, B b', scraper, A, and draft bar, D, substantially as described and for the purpose set forth.

Second, The combination of the wheels, N, and axle, O, with the frame, L, of the scraper, A, when the axle, O, is made and attached substantially as herein described and for the purpose set forth.

57,758.—BUCKLE.—John Peckham, New Haven, Conn.

I claim the combination of the frame, A, and tongue, B, formed and hinged together, in the manner herein set forth.

57,759.—HANDLE FOR COAL SHOVEL.—John Pfeifer, Philadelphia, Pa.

I claim the construction of the handle with the metallic neck, B, shoulder, d, and vanes, f f, in combination with the wooden handle, D, substantially as and for the purpose herein specified.

57,760.—PUMP PISTON.—Burrill and Edwin Pickering, West Milton, Ohio, and Barton Pickering, Montgomery county, Ohio.

We claim, First, The vertical part of the packing piece, A, having an inclined surface as represented for the purpose of holding the flaring packing, F, when combined with the rod, C, and valve seat, B, substantially as described and represented.

Second, The arrangement of the pieces, A B, packing, F, valve, E, and pump rod, C, substantially as described.

57,761.—LIGHTING GAS BY ELECTRICITY.—Robert G. Pike, New York City.

First, I claim a plate for deflecting and spreading the gas as it comes from the burner before striking it with a spark so as the more readily to mingle the air with it before striking, and also for the purpose of directing the gas to the place of striking, substantially as described.

Second, I claim the combination of the metallic gauze, a, or perforated plate with the tube or cap or curved plate, and also with the deflector or spreader, substantially in the manner and for the purpose described.

Third, I claim the metallic button, or its equivalent, upon the deflecting plate, operating substantially as described.

Fourth, I claim the combination of the gauze, a, deflector, D, and boss, n, substantially as described.

57,762.—NECK TIE.—James K. P. Pine, Troy, N. Y.

I claim the imitation neck tie, herein described, adapted for use with a turn-down collar, and consisting of paper of any desired quality or thickness, the surface being ornamented by printing, embossing, painting, staining, or otherwise.

57,763.—FLOOR COVERING.—Anson H. Platt, Ann Arbor, Mich.

I claim, First, The application of paper printed in water colors, to heavy base paper, previously made water-proof by the use of my "water-proof compound," as a substitute for oil cloths and carpets, as herein described, under the head of "hand-made variety of paper floor covering."

Second, I claim the application of ornamental figures printed in water colors directly upon heavy strong paper previously made water-proof by the use of my "water-proof compound" (or by any other similar compound), combined with other articles to form a paint, as herein described, under the head of "factory-made variety of paper floor covering,"

And third, I claim the "water-proof compound," and "enamel coating," as herein described, for the uses and purposes herein specified.

57,764.—APPARATUS FOR SPREADING CEMENT.—Joseph H. Putte, Cincinnati, Ohio.

I claim, First, A cement-spreading machine whose hopper, B, is provided with an adjustable gate, C, arranged and operating substantially as herein described and set forth.

Second, In combination with the adjustable gate, C, I also claim the trowel, D, as and for the purpose explained.

Third, In combination with the elements of the two preceding clauses, I further claim the set screw, E, or its mechanical equivalent, operating as herein explained and described.

Fourth, In combination with the drum, G, I also claim the pressure roller, I, for the purpose set forth.

57,765.—FENDER FOR CARRIAGE WHEELS.—Stephen R. Rumsdell, Providence, R. I.

I claim, First, A rotating fender provided with a projection at one end and a recess at the other, for the reception of an adjustable center pin, in order that said roller may be placed in or removed from its bearings, or adjusted therein with facility, in the manner described.

Second, A bracket having arms provided with bearings for said rotating fender and set at such an angle with the side of the carriage on which it is placed that the wheel when in contact with said fender shall present to it as large a portion of the surface of its rim as possible, or in other words, shall be nearly or quite at right angles therewith, substantially as set forth.

57,766.—FRUIT GATHERER.—F. J. Rauschert, Buffalo, N. Y.

I claim the combination of the strap, A, pole, D, trough, F, having spout, H, and canopy, R, when all constructed and arranged together, substantially as and for the purpose described.

57,767. — CAR COUPLING. — John H. Reed, New Haven, Conn.

I claim the combination of the toggle or coupling pin, c, rock shaft and crank, h and m, and the spring, e, with its appendages, d, when the whole is constructed, arranged, and combined, substantially as herein described and set forth.

57,768.—LAMP EXTINGUISHER.—Wm. A. Richardson and Henry D. Ward, Worcester, Mass.

We claim the combination of loop, B, cap or cover, C, and operating rod, D, with the tube, A, and top of the lamp, substantially as and for the purposes set forth.

57,769. — TOOL. — Charles Richmond, Worcester Mass.

I claim the improved compound tool, consisting of the wrench socket and double bit, all constructed and arranged substantially as herein described.

57,770.—BED BOTTOM.—E. R. Rison, Kinmundy, Ill.

I claim the combination of the wires or cords, C, the upright supporting pieces, B, the gun elastic springs, F, the plates, E, and screws, D, with each other and the frame, A, of the bed bottom, substantially as herein shown and described and for the purpose set forth.

57,771.—SHAFT COUPLING.—Benjamin Roach, Melrose, Mass.

I claim the arrangement and combination of the disk, D, and its ribs, b b, with the two coupling heads, C C, provided with grooves, a a, arranged in them to receive the ribs, as set forth.

57,772.—HOG TROUGH.—William H. Robbins, Richmond, Ind.

First, I claim the construction of trough, A, with the key or wedge bar, C, and lever, B, all arranged and operating as described.

Second, The equal distribution of the feed to each hog through the length of the trough at the same time, and in equal portions.

Third, This device of alternating the opening in the side of the trough, that more hogs can be accommodated in the same space than if they were all allowed on one side of the trough at the same time.

Fourth, I claim the manner of constructing the trough so that the hogs cannot get into the feed, and each one be entirely alone in his mess, all operating in the manner and for the purpose substantially as set forth.

57,773.—GROUND ROLLER.—C. D. Roberts, Jacksonville, Ill.

First, I claim supporting the outer ends of the axles of rolls, C C, in the hinged or vibrating boxes, a a, and the inner ends of the same in free ends of bars, b b, permitting the rolls thereby to adjust themselves to the inequalities of the ground, substantially as described.

Second, I claim the connecting link or bar, c', in combination with rolls, C C, hinged boxes, a a, and bar, b, when the rolls are arranged one in the rear of the other, as and for the purpose specified.

57,774.—MATERIAL FOR KINDLING FIRE.—C. A. Rose, Columbus, Ga.

I claim, as an improved article of manufacture, a fire kindler, made of compressed pine leaves, as herein described.

57,775.—WATCHMAKER'S LATHE.—Frederick Shaller, Hudson, N. Y.

I claim the standard, B, provided with the slot, F, and formed in one piece with the base, C, and arms, D, in combination with the pins, E, bar, G, and rest, I, the whole being constructed and arranged substantially as herein set forth for the purpose specified.

57,776.—CARD RACK.—E. Safford, Boston, Mass.

I claim, First, The peculiar method of shaping and holding in position the slats, S S' S" S"', etc., substantially as described and for the purpose set forth.

I claim, Second, The combination of the slats made and secured as described, with the board, B, and frame, A, substantially as described, and for the purpose set forth.

57,777.—TRAINING GRAPE VINE.—George S. Salsbury, Clarendon, N. Y.

I claim the peculiar manner of training and trimming of the grape vine, so as to make it self sustaining, forming its own trellis, substantially as set forth, claiming the described method in its broadest sense.

57,778.—STOVE-PIPE DRUM.—Hans Henrik Sennicksen, Richmond, Ind.

I claim the combination of the pipes, B and B' D and D' d and d', and the damper, C, when arranged and operated as set forth and described.

57,779.—RAILWAY CROSSING.—John L. Shaw, Fort Wayne, Ind.

I claim the railway crossing consisting of the bed plates, A, lapped and united as described, and used in combination with the rails, B, substantially as described.

57,780.—MACHINE FOR PIERCING LEATHER.—G. V. Sheffield and J. F. Coburn, Hopkinton, Mass.

We claim the combined arrangement of the feed wheel, R, piercing tool, X, hammer, Y, feed rollers, F2, sliding chisel, R2, or its equivalent, substantially as herein described, and as and for the purpose specified.

57,781.—DIE FOR BOLT-HEADING MACHINE.—John W. Sibbet, Cincinnati, Ohio.

First, I claim improved dies, formed in sections, and upon the several faces thereof, constructed, arranged, and combined with each other substantially as herein described, and for the purposes set forth.

Second, The combination with the above of the headers, K, constructed substantially as described, and for the purpose set forth.

57,782.—GATE.—George W. Sigerfoos, Joseph J. Sands, and George Fry, Potsdam, Ohio.

We claim the combination of the posts, B C D F, rollers, m, stay piece, n, and gate, A, substantially as described and for the purposes set forth.

57,783.—MACHINE FOR MAKING METAL TUBES.—Charles G. Smith, Chelsea, Mass.

I claim, in combination with a stationary triblet or mandrel mechanism for feeding the plate, mechanism for bending part of the plate into a tubular form over the surface of the triblet or mandrel, and mechanism for forming the opposite edges of the plate into a lap joint, the whole operating together to form the plate into a tube, substantially as described.

57,784.—MACHINE FOR SINKING HOLLOW PILES.—William S. Smith, Noyesville, Ill.

I claim the method of excavating solid materials from the interior of hollow piles by means of a current of air, using for this purpose the flexible discharge pipe, as herein described.

57,785.—FRUIT GATHERER. — Young W. Smith, Bristol, N. Y.

I claim the combination of the endless adjusting cords, f f, and loops, k k, with the canvas, A, and bracing stakes, B B, operating substantially in the manner and for the purpose herein specified.

57,786.—TUMBLER WASHER.—John Solter, Baltimore, Md.

I claim the employment of a lever, K, or its equivalent, operating the valve stem, e', and valve, e, when in combination with the rim, n, for holding the tumbler, arranged substantially as and for the purposes set forth.

57,787.—GENERATING GAS FOR MOTIVE POWER.—Daniel E. Somes, Washington, D. C.

First, I claim combining nitro-glycerin with alkali, and converting the same into gas to be used as a motive power.

Second, Combining any kind of oil or fatty matter with alkali, and converting the same into gas to be used as a motive power.

Third, Compressing gas, air, water, steam, or any other liquid or volatile substance, substantially as and for the purpose herein described.

Fourth, The apparatus herein described, or its equivalent devices, for compressing gas, air, water, steam, or any liquid or volatile substance, and using the same as a motive power.

57,788.—APPARATUS FOR CARBURETING AIR.—James F. Spence, Williamsburgh, N. Y.

First, The case, A, provided with two or more air or steam wheels, B B, working in the liquid in conjunction with each other, substantially as and for the purpose set forth.

Second, Heating the oil before it enters the machine by the jacket, E, surrounding the supply tank, D, in combination with a hot air or steam pipe, b, or any other suitable means, substantially as and for the purpose described.

Third, The hot-air chamber, F, in combination with the burner, a, case, A, and jacket, E, constructed and operating substantially as and for the purpose set forth.

Fourth, The float, d, provided with a valve, f, in combination with the liquid supply pipe, g, and case, A, constructed and operating substantially as and for the purpose described.

57,789.—HORSE HAY FORK.—William S. Spratt, West Manchester, Pa. Antedated August 17, 1866.

I claim the combination and arrangement of the rod, b, provided with guide, l, and prongs, g and h, link or rod, c, lever, d, pulley, o, when used in connection with the frame, a a, constructed, arranged, and operating in the manner herein described and for the purpose set forth.

57,790.—MANUFACTURE OF SCYTHE STONES.—Alvin G. Squire, Pelham, Mass.

The cast-steel band and the mode of attaching it to the stone or wood, prepared as above stated, and to be used in connection with such stone or wood for the purpose of sharpening scythes, edge tools, and other implements requiring a sharp edge,

57,791.—CONSTRUCTION OF JOINTED MOLDS.—M. B. Stafford, New York City.

I claim a jointed mold composed of two parts, b b, connected together and constructed substantially as herein shown and described, so that when said parts are closed, a smooth interior is obtained, and the article or substance compressed and molded without leaving any crease, impression, or ridge, as set forth.

67,792.—CULTIVATOR.—Addison F. Stillwell, Fayette, Iowa.

I claim the bar, E, beam, A, and cross bars, G, in combination with the bars, I, projections, b, spurs, f, shares, J, and brace rods, K, all arranged to operate as and for the purposes set forth.

57,793.—ATTACHING ARTIFICIAL TEETH TO BASES.—S. W. Stockton, Philadelphia, Pa.

I claim securing artificial teeth and gums to plastic bases by means of the tenons, d, arranged along on the rear part of that portion of the porcelain blocks which project inward just above the teeth, substantially as shown in the drawings and herein described.

57,794.—CHURN.—Henry C. Stoll, Mokeona, Ill.

First, I claim the arrangement and combination of the twisted parts, B, with the lever, C, and standard, A, as set forth.

Second, The combination of the support, D, slide, L, and dasher rod, F, substantially as described.

57,795.—PROCESS FOR TANNING.—J. N. Sturtevant and Harvey E. Jones, McGregor, Iowa.

We claim the within described process for tanning leather, when used substantially as herein specified.

57,796.—PLOW. — George W. Thompson, Ripley, Ohio.

First, I claim the attaching of the mold boards, F* F*, to the standard, F, by means of the universal joint composed of the swivel bolt, a, and hinge or joint, b, substantially in the manner as and for the purpose set forth.

Second, The brace, F', applied to the beam, A, and land side, F, substantially as and for the purpose specified.

Third, The combination of the land side, F, standard, E, and the mold boards, F* F*, attached to the standard by the universal joint, substantially as and for the purpose set forth.

Fourth, The fastenings composed of the pivoted bars, G G, attached to the beam, A, substantially as and for the purpose specified.

57,797.—ROCK-DRILLING MACHINE.—George Freeman Underhill, New York City.

First, I claim the divided frame work, A, hinged together, having the drill rod, H, arranged in its upper section, B, in combination with the clamping devices for securing the sections of the frame work together, substantially as and for the purpose described.

Second, The arrangement of the sliding or lifting frame, M, tappet shaft, q, and the polygonal-shaped drill rod, H, substantially as and for the purpose described.

Third, The eccentric, V, of shaft, q, yoke or collar, W, lever, Y, arm, A^2, frame, B2, ratchet wheel, D2, and pawl, E2, when all arranged and combined together, so as to operate upon the drill rod, substantially in the manner and for the purpose specified.

Fourth, The use of rubber cushions upon the under side of the base portion of the frame work, for the purpose specified.

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57,798.—PROPELLING APPARATUS FOR BOATS.—Maurice Vergnes, New York City. Antedated Aug. 3, 1866.

First, I claim the erection of the supporting arms, movable at base and apex, spread at the base for solidity and strength, in combination with the oar arms to guide, steady, and support them, in the manner and for the purpose described.

Second, Hinging the supporting arms upon a carriage set on rail, which can be moved to and fro to vary the dip of the oar in the water, and for the purpose of removing the oar from the water, in the manner described.

57,799.—STEAM ENGINE.—George J. Washburn, Worcester, Mass.

I claim the arrangement in the diaphragm cylinder of the two pistons on the same rod, operated as described.

I claim in its arrangement with the double cylinder and pistons, the single valve controlling the steam openings, substantially as described.

I claim the arrangement of the valve chest, F, double cylinder, A A', and side chests or pipes, K L, the latter communicating, each by a single part, with the chest, F, and simultaneously, by duplicate parts, with the spaces on corresponding sides of the two pistons.

57,800.—MACHINE FOR PRESSING TOBACCO.—Wm. H. Watson, Yonkers, N. Y. Antedated Aug. 21, 1866.

I claim, First, The chain, 5, constructed and operating substantially as described for the purposes specified.

Second, I claim the pressing blocks, 36, constructed and operating substantially as described for the purposes specified.

Third, In combination with the chain, 5, constructed and operated substantially as shown, I claim the pressing blocks, 36, constructed and operating substantially as shown, for the purposes shown.

Fourth, The heating chambers, constructed and operating substantially as described for the purpose specified.

Fifth, In subjecting the tobacco or other substance to be pressed to the influence of heat while under pressure, as shown for the purposes designated.

57,801.—WHIFFLETREE.—George Watt, Richmond, Va.

I claim, First, The construction of a double, single, or treble tree, so that it, by means of one or more of its bent sides, shall form an elastic connection between the draught animals and the object (wagon, plow, etc.), as described.

Second, The attachment of the double tree by its longest side to the plow beam, as and for the purpose described.

57,802.—WEEDING HOE.—W. J. Wells, Sidney, Ohio.

I claim the cross arm, D, having its button, F, and sides, G, beveled and pointed at its ends, substantially as and for the purpose described.

I also claim, in combination with the above, the side arm, E, for the purpose specified.

57,803.—DRIVING-REIN HOLDER.—Milton Whipple, Medina, N. Y.

I claim the device herein described, consisting of the parts, A and B, constructed so as to operate substantially as described and designed for holding the driving reins of horses while temporarily leaving a carriage.

57,804.—KNIFE SHARPENER.—Thomas H. White, Orange, Mass.

I claim the arrangement and combination of the circular disks, B B', with the stock, A, and the strap or hone, C, substantially as described and for the purpose set forth.

57,805.—COOLING LARD.—William J. Wilcox, New York City.

I claim the within described method of cooling lard, by passing over or through the same one or more impelled currents of cold air, substantially as and for the purpose described.

57,806.—EVENER FOR POLES FOR WAGONS, ETC.—Henry F. Wilson, Elyria, Ohio. Antedated Aug. 15, 1866.

I claim the radial, c, and stationary pin or bolt, b, in combination with curved slot, a, and stationary pin, d, the whole being constructed in the manner and for the purpose set forth and described.

57,807. — CAR COUPLING. — George W. Wilson, Abingdon, Ill.

I claim constructing a car coupling of two doubleslottedblocks, A A, with hooks, b b, on one of the prongs, a a, of each block, fitting into corresponding grooves in the prongs, a' a', of the other block, combined with the shackle, c c, and the arms, f f, constructed, arranged and operated as and for the purposes herein described.

57,808.—MAGAZINE FIRE-ARM.—O. F. Winchester, New Haven, Conn.

First, I claim constructing the tube or magazine, substantially in the manner described, so that the inner tube may be removed, in combination with the carrier, E, breech pin, L, and barrel, A as and for the purpose specified.

The combination of the stop, S, lever, H, and carrier block, E, when arranged to operate substantially as and for the purpose specified.

57,809.—CARRIAGE THILL.—Benjamin L. Wood, Taunton, Mass.

I claim, as my invention, the improved shaft or pole connection as made with a hook, c, and an aperture, d, therein, arranged with the start bolt, a, and to receive a strap or its equivalent, as specified.

I also claim the arrangement of the safety strap, G, to pass through the aperture of the hook, as described.

I also claim the combination of a strap or its equivalent, to go through the eye of the hook, with such hook, and the shaft or its equivalent.

I also claim the arrangement and application of the anti-friction strap, I, with the shaft or its equivalent, and the hook, c, provided with an aperture, d, as and for the purpose described.

57,810.—WAGON BRAKE.—L. E. Woodard, Cohocton, N. Y.

I claim the combination of the eccentric, L, rod, m, pole H, and friction roller with the brake, e, bars, I I, when constructed for the purposes and substantially as herein described.

57,811.—WATER ELEVATOR.—Alfred Woodworth, North White Creek, N. Y.

I claim the pulley, E, keyed on one end of the windlass shaft, a, and having a cylindrical shell, F, placed over it, with a handle or crank, G, pivoted in the shell, and provided with a shoe, c, at its inner end within the shell, in combination with the pivoted bar or stop, H, on the curb, all arranged to operate substantially in the manner as and for the purpose set forth.

57,812.—APPARATUS FOR CARBURETING GAS.—Thomas D. Worrall, New York City.

First, I claim introducing into a gas pipe carbon spirit, for the purpose of enriching, purifying, or increasing the quantity of common gas, water gas, or common air.

Second, Introducing into a gas pipe fibrous material of any desired or suitable kind, for the purpose of drawing up or letting down carbon spirit, so as to vaporize said spirit, for the purposes set forth.

Third, The use of a large gas pipe, into which smaller ones conduct, or out of which they convey any kind of gas, so as to form a reservoir in which said gas can be detained for a long time, while being enriched by the vapors of carbon spirit or other carbonizing fluid.

Fourth, Inner casings of gas pipe of any desirable device, made to hold carbon spirit or other carbonizing fluids, and also to contain fibrous material for holding in suspension and vaporizing the same, while ordinary gas, water gas, or common air is passing through over or under them.

Fifth, The gas pipe, Fig. 1, with chamber in the bottom for holding any carbonizing material, for the purposes described.

Sixth, The gas pipe, No. 2, with chamber and fibrous material stretched horizontally along it, and from which the ends of other fibrous material drop into the carbonizing fluids, and convey them by capillary attraction to those stretched along it, for the purposes set forth.

Seventh, The gas pipe, No. 3, with holes drilled in or through the top, for the purpose of suspending wicking or other fibrous material that shall hang in carbon spirit, and drawing up said spirit, for the purposes set forth.

Eighth, The gas pipe, No. 4, in which strips of wood or wire run along the top of the pipe, on the inside, either across or in a longitudinal direction, for the purpose of holding wicking or other fibrous material, while the lower ends of the same are immersed in the spirit or fluid, for the purpose set forth.

Ninth, The gas pipe, No. 5, in which is inserted an inner casing or tube perforated with numerous holes, and through which cotton wicking or other suitable material is drawn, so as to form a perfect retina or net-work, in which the carbon vapors are thrown off, and through which any kind of gas may at the same time pass, for the purpose of being enriched or multiplied thereby.

Tenth, The gas pipe, No. 6, in which is contained a smaller perforated pipe or tube, around which and through which cotton or other fibrous material is passed, and over the whole of which a series of broad bands of wicking or a continuous apron is passed, for the purpose set forth.

Eleventh, The perforated tin or wire gauze inserted in a gas pipe for the purpose of distributing the gas to any or all parts of the pipe, as set forth.

Twelfth, Gas pipe, Fig. 8, with longitudinal partitions with or without coverings of fibrous material to insure that the gas to be enriched may run back and forth, for the purpose set forth.

Thirteenth, Gas pipe, Fig. 9, in which a series of partitions or chambers, each separate or all connected by apertures, is formed, and over which fibrous material is laid, in the manner and for the purpose described.

Fourteenth, Gas pipe, Fig. 10, with loop holes suspended from the top, through which cotton or other fibrous material may pass and be suspended in carbonaceous fluids, for the purposes set forth.

Fifteenth, Gas pipe, Fig. 11, in which is a spiral or screw-shaped pipe, cased or surrounded with fibrous material, around which gases and the vapor of carbonizing fluids may pass, for the purposes set forth.

Sixteenth, Gas pipe, Fig. 12, inside of which is a wire tube, around, along and across which fibrous material may be stretched and from which it may hang suspended, for the purposes set forth.

Seventeenth, The compound gas pipe, Fig. 13, two or more in any connected together, for the purpose set forth.

Eighteenth, Gas pipe, Fig. 14, in which several chambers are cast or otherwise constructed, so as to contain carbon spirit or other carbonaceous fluid, and in which said fluids may be transmitted from chamber to chamber by means of fibrous material, or in which in any other way the fluids may be vaporized, for the purpose described.

Nineteenth, The arrangement in combination with any of my devices of a gas burner, that can be turned and lighted under the reservoir, for the purpose set forth.

Twentieth, I also claim the use of each of the devices seen within the gas pipes, Fig. 5, Fig. 6, Fig. 9, Fig. 10, Fig. 11, and Fig. 14, for use in any other box or chamber, as well as in gas pipes.

57,813.—EAVESTROUGH.—William Yapp, Cleveland, Ohio.

I claim the brace, B, with one end forming a loop and the other a lap, in which is formed a concave, e, in combination with the clamp, c, pivot, a, trough, A, and arm, D, in the manner and for the purpose, substantially as set forth.

57,814.—LIFTING JACK.—A. Zink, Lancaster, Ohio.

I claim the shape and construction of the lever jack, when arranged with the shifting link and adjustable catch, as secured thereto, as herein described, and for the purposes set forth.

57,815.—DITCHING MACHINE.—Jacob Ballard, New Antioch, Ohio, and Thomas J. Magee, Cincinnati, Ohio, assignors to themselves and Paul Hults, New Antioch, Ohio.

We claim, First, The arrangement of sliding mold boards, J, lower and upper guides, D and I, elevating mechanism, K L, and adjustable brace, P, or their mechanical equivalents, substantially as set forth.

Second, In the described combination the beam, A, sloping sheath, B, share, C, and the colters, G and H, as and for the purpose set forth.

Third, The clinometer attachment, W X, in combination with a supporting truck, T, and regulating screw, V, for the purpose explained.

Fourth, The shiftable handle, N, and ditch wheel, O, secured and operated as set forth.

57,816.—RAILWAY CHAIR.—John W. Draper (assignor to himself and Arthur C. Stowell), Wilmington, Del.

I claim the combination of the plate, A, its beveled lugs, c c', cheeks, C C', and bolts, D D', the whole being constructed, arranged, and adapted to the rail, substantially as and for the purpose specified.

57,817.—PRUNING INSTRUMENT.—Joseph Evans, Newark, N. J., and Bobert H. Seymour, Bloomfield, N. J., assignors to Henry Seymour, Elizabeth, N. J.

We claim constructing the cutting blade, C, with a groove, a, along its upper back edge, and so arranging in combination therewith, a cap or clamp, D, carrying a pin, b, that the blade will be guided so that it will operate upon the twig with a drawing cut in a direction from a bend in the hook, substantially as described.

Second, The spring lever, E E', in combination with the cutting blade of a pruning knife constructed and applied substantially as described, whereby the knife may be operated in a quick and easy manner.

Third, We claim the combination with each other of the diamond-shaped knife, C, hook, B, rod, F, and spring levers, E E', arranged and operating substantially as herein shown and described.

57,818.—FAUCET.—John Fahrney (assignor to himself and Samuel Fahrney), Boonsboro, Md. Antedated Aug. 23, 1866.

I claim, First, The cylinder, A, with valve, H, in combination with piston, I, with its openings, a a, its rod, G, sliding through and turning in its center as shown at c d, and the circular plate, J, attached to end of the piston rod, as and for the purposes described.

Second, In combination therewith, the cut-off piston, F, neck, E, with its lower wall removed as shown at M, as and for the purposes described.

Third, The nut, H, with its projection, e, plate, L, and gage screws, f f, as and for the purposes described.

57,819.—BARREL LIFTER.—Lucius H. Goff (assignor to Thomas C. Winslow), St. Albans, Vt.

I claim the barrel lifter herein described, the same consisting of a notched bar or lever, B, having hooks, C C, hung upon it, and moving under bands, D, or their equivalents, substantially as herein described and for the purposes specified.

57,820.—WHIFFLETREE.—W. A. Harrall (assignor to himself and McCrellis Gray), Washington, Ind.

I claim the combination of the lever, H, spring, I, arm, G, spring, K, bar, J, band, D, and whiffletree, B, with each other and with the cross bar, a', of the thills, when said parts are constructed and arranged substantially as herein described and for the purpose set forth.

57,821.—CLASP FOR HOLDING NECKTIES AND SHIRT COLLARS TOGETHER.—Charles M. Hyatt (assignor to Lansingh and Osborne), Albany, N. Y.

I claim the within described attachment for securing the necktie to the collar consisting of the clip, A B, and of spurs, p, combined and arranged substantially as set forth.

57,822.—MOLDING.—Armon King (assignor to himself and John H. Chapman), Utica, N. Y.

I claim match plates constructed substantially as described and used in connection with patterns forming cores for sand molds, in the manner set forth.

57,823.—PISTON FOR STEAM CYLINDER.—Mathew B. Mason (assignor to himself and George W. Harris), Aurora, Ind.

First, I claim the arrangement of the L-shaped packing rings, I I', and middle ring, J, as described and for the purpose specified.

Second, The grooved and perforated ring, G, constructed as and for the purpose specified.

Third, The double headed valves, H, constructed and arranged substantially as described and for the purpose specified.

57,824.—SCHOOL DESK AND SEAT.—George Munger (assignor to J. W. Schermerhorn), New York City.

I claim as an article of manufacture, a desk consisting of the standards, A, brackets, a, both having their top edges dove-tailed, grooved seat, B, grooved top, C, grooved back strips, c, grooved shelf, E, with stops, f, constructed and combined as and for the purposes specified.

57,825.—METHOD OF RECEIVING AND DISCHARGING FREIGHT.—Newton A. Patterson (assignor to himself R. K. Byrd), Kingston, Tenn.

I claim, First, A frame bridge-way made in sections and provided with upper and lower tracks, D E, substantially as described and for the purpose set forth.

Second, The combination of the cars, G, constructed as described with the sectional bridge-way, and with the revolving cylinders, F, substantially as and for the purpose set forth.

57,826.—PORTABLE RAILROAD.—Johann N. Peteler, Sheppach, Kingdom of Bavaria, assignor to Alois Peteler, New Brighton, N. Y.

I claim a portable railroad composed of sections, A, turnouts, B, supporting frames, C, bridges, D, crossings, E, and one or more turn tables, F, all constructed, combined and operating substantially as and for the purpose set forth.

Second, The combination of the perforated studs, a, and turn table, F, provided with rails, b, constructed and operating substantially as described, for the purpose specified.

57,827.—MACHINE FOR BORING WELLS.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City, N. Y.

I claim, First, The adjustable clamp, I, in combination with the drum, C, and rising and falling pulley, J, constructed and operating substantially as and for the purpose described.

Second, The steam cylinder, M, and pulley, J, in combination with the calmp, I, and drum, C, constructed and operating substantially as and for the purpose set forth.

Third, The adjustable table, P, in the reservoir, N', in combination with the sand pump, O, constructed and operating substantially as and for the purpose described.

57,828.—DRILL FOR BORING WELLS.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City, N. Y.

I claim, First, The reamer, F, in combination with the drill rod, A, and cutters, C, constructed and operating substantially as and for the purpose set forth.

Second, The sleeve, F, with ratchet teeth, i i', in combination with the circular rack, j j', and drill rod, A, constructed and operating substantially as and for the purpose described.

57,829.—COFFIN.—Julian A. Fogg, Stockport, Eng.

First, In the construction of coffins and burial cases, I claim the employment of the metallic corner pieces, joints, or connection, C, as described, whereby great durability and strength are given to the coffins or burial caskets, and a provision for an elaborate ornamentation of the same at little expense, substantially as specified.

Second, I claim as an improvement in coffins and burial cases the arrangement of the plate upon an edge of one of the sides or ends of the coffin or on a bracket or shelf secured thereto in such a manner that the plate will be visible whether the lid be open or closed, substantially as specified.

57,830.—SAND PUMP.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City.

I claim the movable seat, b, clack, a, and rod, c, in combination with the barrel, A, and bucket, B, constructed and operating substantially as and for the purpose described.

57,831.—WATER WHEEL.—Pierre Francois Millott, Paris, France.

First, I claim the combination of a series of buckets open internally and externally to receive the water internally, in the manner described, upon each side of the arms, and discharge it externally, and a series of arms attached at or near the middle of said buckets, to allow the water to be introduced on both sides of them, and connecting said buckets to the shaft, as set forth.

Second, The combination of a series of buckets open as aforesaid to receive water internally and discharge it externally, with the shaft of the wheel and the arms, B B, the said arms, B B, being set at an angle to each other converging from points separated and distant from each other at the inner end to the middle of the bucket, as set forth.

Third, The arrangement in combination with a wheel adapted thereto of two separate spouts in such a manner as to discharge water into the interior openings between the buckets on each side of the arms of the wheel, substantially as described.

Fourth, The combination with the internally and externally open buckets to receive the water internally and discharge it externally, as described, of the projecting flange, e, to retain the water on its entrance into the buckets, as set forth.

57,832.—COATING SHEET IRON WITH TIN AND OTHER METALS.—Edmund Morewood, London, Eng.

First. I claim the slide, B, to receive the sheet or piece of metal to be coated, in combination with a receptacle, C, within the bath of coating metal to convey said sheet or piece of metal to the point of delivery, substantially as specified.

Second. I claim the delivery rollers, F, in combination with the receptacle, C, and an elevating apparatus to raise the sheets or pieces of metal to the delivery rollers, F, substantially as set forth.

Third, I claim wipers or rubbers, G, in combination with delivery rollers, F, to act upon the coating metal previous to the delivery of the sheet or piece of coated metal, for the purposes and as specified.

Fourth, I claim a slide or receptacle, in a bath of melted coating metal, to receive the sheets or pieces of metal at one place and convey them to a different place in said bath, where said sheets or pieces are delivered upward automatically from said bath, as set forth.

Fifth, In combination with an apparatus for coating sheets or pieces of metal, substantially as described, I claim a pair of delivery rollers, one of which is set in yielding bearings so as to provide for varying thicknesses of the sheets, or of the coating, as set forth.

57,833.—CIDER MILL.—Hugh Sells, Vienna, Canada West.

I claim, First, The projections, h h, in combination with the case, B, forming the passages, i, substantially as and for the purpose specified and described.

Second, The dovetail-notched rings, G, substantially as described for the purpose specified.

57,834.—APPARATUS FOR TRIMMING SHIPS.—William Louis Winans and Thos. Winans, London, England. Patented in England Dec. 21, 1863.

We claim the employment, for the purpose above described, of a movable weight, operated either by steam power, or hydraulic power, or by gearing connected with the propelling engines, as herein set forth.

57,835.—COUPLING FOR PROPELLER SHAFTS OF SHIPS.—William Louis Winans and Thomas Winans, London, England. Patented in England, June 20, 1863.

We claim coupling shafts by means of a block or plate, provided

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with grooves, in which are inser'ed cross-pieces or T-pieces, attached to the ends of the shafts to be coupled, as herein set forth.

57,836.—PROPELLER FOR SPINDLE-SHAPED SHIP.—William Louis Winans and Thomas Winans, London, England. Patented in England June 22, 1863.

We claim, as aforesaid, the application of two large screw propellers to spindle-shaped ships or vessels, in the manner and for the purposes herein set forth.

57,837.—SYSTEM OF CUTTING DRESSES.—Mrs. H. M. Carpenter, Grand Rapids, Mich.

I claim the use of the patterns, constructed and applied, as shown and described, for cutting dresses for women and children.

REISSUES.

2,347.—SALINOMETER.—Benjamin F. Bee, Harwich, Mass. Patented Jan. 9, 1866.

I claim, First, The combination in a salinometer of the closed transparent vessel (for containing the liquor to be tested) and a float for indicating the density of the liquid, these two operating substantially as set forth.

Second, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed transparent vessel, salinometer float, supply pipe, and escape pipe, all operating in the combination substantially as set forth.

Third, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, supply pipe, escape pipe, and air valve at the top of the vessel, all operating in the combination substantially as set forth.

Fourth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, salinometer float, and guide for float, the salinometer, all operating substantially as set forth.

Fifth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, and closed case communicating therewith for the thermometer, both operating substantially as set forth.

Sixth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, salinometer float, and thermometer, all operating substantially as set forth.

Seventh, I also claim the combination in a salinometer of the closed vessel, with an escape valve, having the valve and screw independent of each other, so that the valve may be turned upon its seat to lighten the joint, substantially as set forth.

2,348.—HARVESTER.—M. Easterbrook, Jr., Geneva, N. Y. Patented May 22, 1866.

I claim, First, The combination of the hand lever, C, and two loose pinions, p and p', with the double pinion, b, and the spur wheel, B, arranged and operating substantially as and for the purposes set forth.

Second, The two loose pinions, p and p', whether they are adjusted with a hand lever or other suitable device, in combination with the double pinion, b, and the spur wheel, substantially in the manner and for the purposes shown and described.

Third, The arrangement of the pinions, p and p', upon a pivoted hand lever, substantially as shown in Fig. 3, having its axis or center of motion upon the counter shaft, as and for the purposes set forth.

Fourth, The employment of the pinion, b, of the counter shaft, made independent of the spur gear, B, and connected thereto when desired by one of two intermediate adjustable gear wheels, arranged and operating substantially as and for the purposes set forth.

2,349.—CONSTRUCTION OF CHURN BODIES.—J. C. Hills, Willoughby, Ohio. Patented May 24, 1864.

I claim the above-described construction of a churn body, consisting of the sides, A A, the sheet, A', groove, B B', bars, C C', and E, when constructed and arranged in the manner and for the purpose specified.

2,350.—MANUAL-POWER MACHINE.—Isaac C. Overpeck, Overpeck's Station, Ohio. Patented April 25, 1865.

I claim the two levers, d and e, moving simultaneously toward and from each other, when arranged to operate upon a center wheel, b, or its equivalent, substantially in the manner and for the purpose herein specified.

2,351.—SPINNING MACHINE.—William Earl, Jr., Nashua, N. H. assignee of Thomas Pye, New Hartford, N. Y. Patented Feb. 14, 1865.

I claim, First, The moving of the belt shifter, C, in a spinning machine, by the ordinary operation of the machine, at the point or time when the thread is fully twisted as desired, and the jack is about to be returned for the purpose of winding up the thread in such manner that the belt, R, is partially thrown on to the tight pulley, g, for the purpose of assisting the spinner in running up the jack and in making a tight bobbin, in the manner and by the means substantially as herein described and set forth.

Second, I claim the moving of the said belt shifter, C, by the ordinary operation of the machine, at the moment when the jack is nearly run up to the required or desired point or place for the piecing up of the thread, and just before it is fully wound upon the bobbins, in such manner that the said belt is thrown wholly off from the tight pulley aforesaid, and upon the said loose pulley, in the manner and by the means substantially as herein described and set forth.

Third, I claim the employment of the crooked lever, A, the oblique lever, B, and the angular lever, D, as arranged and combined, and then the whole in combination with the aforesaid belt shifter, C, in the manner and for the purposes substantially as herein described and set forth.

Fourth, I claim the employment of the chain, E, arranged and combined with the angular lever, D, and the slide bolt, F, in the manner and for the purposes substantially as herein described and set forth.

Fifth, I claim the combination of the slide bolt, F, with the coil or spiral spring, H, the bolt stock, G, and the shoe, b, and with a drop or sliding bar, d, each being arranged and combined in the manner and for the purposes substantially as herein specified, described, and set forth.

Sixth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, salinometer float, and thermometer, all operating substantially as set forth.

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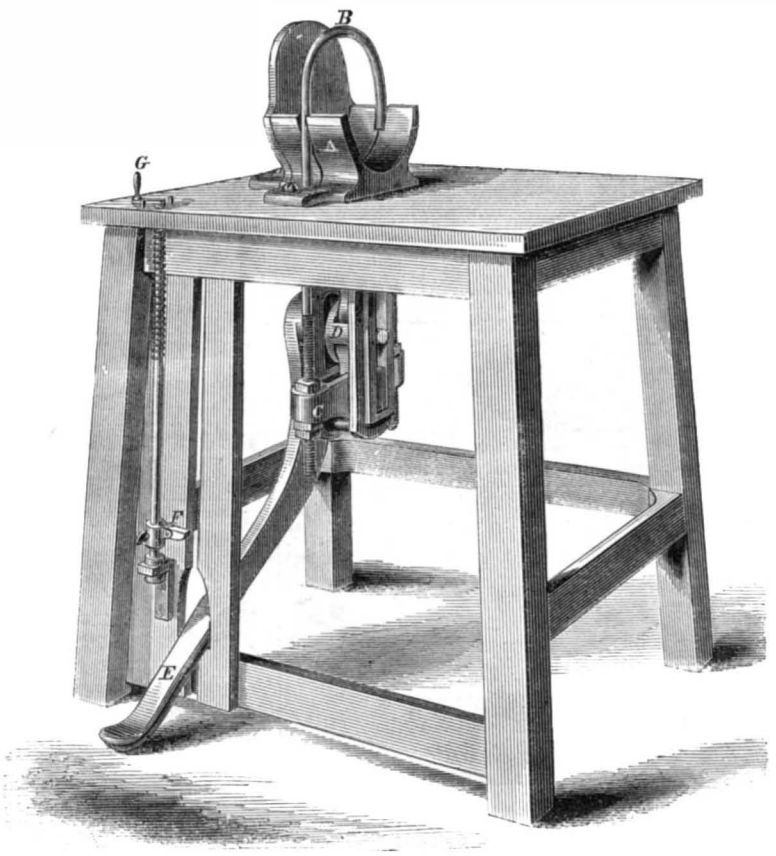
Improved Wood-bundling Press.

In cities and large towns where the principal fuel used is coal, the work of preparing kindling wood for starting fires has become an important business. Frequently the wood, saw edinto convenient lengths and properly split, is delivered by a team, the fuel being packed in boxes or barrels. But the public requirements in the cities necessitate smaller and more portable packages. It is customary, therefore, to put the wood up in small bundles secured by a cord. To facilitate this bundling operation is the design of the machine herewith illustrated.



GREENE'S WOOD-BUNDLING PRESS.

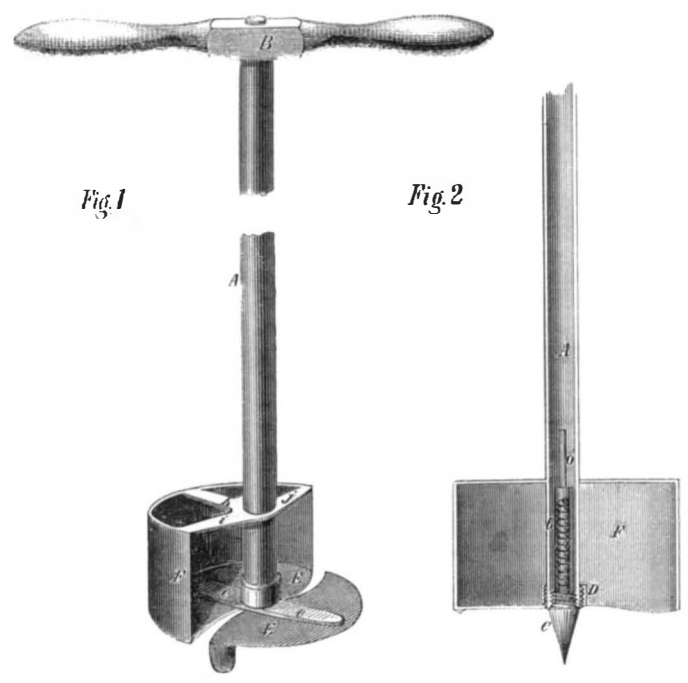
It consists of a table having on its upper surface an iron box, A, cut through the sides, at the center, for the reception of the binding cord. A yoke, B, rises above the box and is attached, at either end, to a slide, C, which is moved up and down by means of double levers. The lower one is pivoted to the slide, and the upper one to the frame on the lower side of the table bed. The approaching ends of the levers engage a toggle, D, the shank of which attaches to the treadle, E. By raising the treadle, E,the yoke, B, is raised and secured in place,while the wood is being placed in the box, by the jointed foot, F, which allows the treadle to be raised, but keeps it from falling. When the wood is in the box, by turning the handle, G, the foot, F, is partly rotated, allowing the treadle to move down. A spiral spring brings the foot with its shaft back to place, and the foot can be elevated to any required point by means of a thumb screw.

This appears to be a convenient contrivance for the purpose intended. It was patented July 5, 1866, by Darwin A. Greene, and is manufactured by the Miles Manufacturing Co., 59 Lewis street,New York, whom address for additional particulars.

Patent Earth Borer.

The invention herewith illustrated appears to be one of those simple improvements which, when known, excites surprise that it had not been before discovered. A glance at its advantages is sufficient to demonstrate its efficiency.

The engraving represents a perspective and a sectional view of a simple apparatus now in use, for boring holes for fence posts, wells, driving pipe for oil wells, telegraph poles, etc. It is equally efficient on a large scale as when operated by hand for post holes. By reference to the engraving, the description will be readily understood. The shank, A, is of wrought-iron pipe, for a reason which will be presently explained. It may be made of any length desired, by adding sections as the work progresses, or it may be fitted with a handle, B, for ordinary purposes. To the bottom of the shank a cross arm, *e*, is secured, to which the blades, E, are fastened. F is a semicircular scoop for removing the earth or water, and for sustaining the apparatus in an upright position in boring deep holes. It is secured to the shaft, A, by the radial arms, *h i j*. C is the point of a valve, the stem of which, *o*, extends up through the pipe, *b*, which screws into the lower end of A. This valve is held up against its seat, at the lower end of A, by a spiral spring. The object of this attachment is to destroy the vacuum formed under the borer when it is raised, or, rather, to counteract the downward pressure of the external atmosphere; for the borer with its load of earth fits the hole as a piston fits a cylinder. But upon raising the borer the air rushes down the tube, A, overcomes the resistance of the spiral spring, and allows the apparatus to be lifted. Patented July 31, 1866, by Samuel Cary, of Centerville, Parish of St. Mary's, La., whom address for further particulars.



CARY'S IMPROVED EARTH BORER.

What is a Metal?

Notwithstanding the boasted exactness of definition which we are accustomed to ascribe to scientific nomenclature, the branch of chemistry is unable to furnish a concise definition, of universal acceptance, by which we can with certainty determine the right of any substance to be ranked as a metal. Authorities differ in their acceptance of what shall, and what shall not, be included under this broad class. The old proverb recurs with redoubled force, "Who shall decide when doctors disagree?"

In this connection, in a late article, the *Mechanics' Magazine* makes the following pertinent remarks:

"We have no general definition of a metal to show us what constitutes any substance metallic or non-metallic. This is very odd, as metals are considered to form such a distinct class from other substances. Besides, chemistry is held to be such a marvelously exact science. Still, the most learned in chemistry are not agreed as to what substances are metals. Some say 'silicium,' which is its name as a metal; others say 'silicon,' which is its name as a non-metallic substance. Then some take into the list of metals arsenic and tellurium, and others reject them. There apparently is no property yet discovered that is common to the whole list of fifty-two metals. Some even go so far as to consider that a metal may be a compound of two gases, nitrogen and hydrogen. In fact, it is altogether uncertain what constitutes a metal and what does not. The word metal, apparently, is just a name, without any distinctive and well ascertained properties attached to it or understood by it. It is hardly in agreement with the pretensions of our chemists that there should be such looseness and uncertainty about the application of a name, and a name of such importance, which represents such a common class of substances."

Securing Lumber on Wagons.

Long lumber is generally loaded on teams with the front ends of the boards much higher than the rear end. The load is secured by ropes, which is not a handy or always effectual means. A correspondent, Y. B., sends us a simple device which is merely a network of strong cords, or small ropes, with two lines attached, one end of which, furnished with rings, is hooked under the wagon, and the other brought up and tied to stakes on the team. The net holds the ends of the lumber. When not in use it can be fastened under or carried in the wagon.

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MECHANICS

INVENTORS, MANUFACTURERS.

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